



## **GlobeDrought: Towards a stakeholder-supported global drought information system**

Eklavyya Popat (1), Claudia Herbert (1), Petra Döll (1), Stefan Siebert (2), and Jürgen Kusche (3)

(1) Goethe University, Institut für Physische Geographie, Frankfurt am Main, (2) Georg-August-Universität Göttingen, Department für Nutzpflanzenwissenschaften, Göttingen, (3) Universität Bonn, Institut für Geodäsie und Geoinformation, Bonn

The aim of the BMBF project GlobeDrought is to develop a stakeholder-supported web-based information system for comprehensive characterization of drought events and their impacts on water resources, productivity of crop, sale of food and need for international food aid. It is intended to provide information on occurrence of drought hazard and drought impacts/ risks for a historical time period with good data availability (approx.2003-2015), at global and selected regional scale.

Overall, the project aims to combine satellite-based remote sensing and precipitation data analysis with hydrological modeling and yield modeling. This will provide indicators for the characterization of meteorological, hydrological and agronomic droughts that will allow the quantification of drought hazards. The analysis of socio-economic data enables the quantification of exposure and vulnerability. As part of a co-design process, users and stakeholders influence the content and technical design of the drought information system. The global scale analysis planned in the project will be accompanied with more detailed analysis on severely drought-affected regions, such as Southern Africa. In addition, integration of an experimental early warning component allows monitoring of drought and its risks to near-real time to manifest current drought situation and simulate probabilistic drought forecasts for the next year at global scale as well as in selected regions. The developed drought information system is intended to support political decision-makers and practitioners such as “Welthungerhilfe”, which is also a project partner.

Initial results of the subproject on the quantification of hydrological droughts are presented. Different hydrological drought indicators are calculated based on the output of the global hydrological model WaterGAP 2.2b for the period 2003 to 2015. Daily time series of river discharge, soil water content, groundwater storage, water storage in surface waters and total water storage (TWS) are determined with a spatial resolution of 0.5 ° cells. All five variables are used in calculation of consistent drought indicators using different methods and checking their informative value. Spatial extent of droughts is also considered. Alternatively, total water storage anomalies (TWSA) -based indicators are also calculated using GRACE gravity field data and then compared to WaterGAP results. In the further course of the project, the uncertainty of the WaterGAP time series is to be reduced by assimilation of GRACE TWSA.