



Assessing risk by impacts: a probabilistic approach for drought assessment in Europe

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The risk of natural disasters in a very general sense is a combination of hazard and vulnerability. For drought, the hazard is commonly derived from the statistical analysis of one or a set of drought indicators. Their selection mostly depends on the focus of the study, with the usage of standardized indices experiencing growing popularity. Vulnerability to drought is typically estimated by a subjectively weighted combination of relevant factors describing different aspects of vulnerability, such as exposure, sensitivity and adaptive capacity. This epistemic approach requires explicit information on physical, ecological, institutional and socioeconomic parameters. Even though impacts are known as symptoms of vulnerability and risk is often defined as the likelihood of impact occurrence (e.g. by the IPCC 2012 SREX report), information on past impacts is only poorly integrated in current drought risk assessment. Only few approaches have verified their vulnerability index with past impact information. We present a probabilistic approach to estimate drought risk based on the assumption that a system is vulnerable if it was impacted during a certain hazard. Thatfore, information on past drought impacts from the European Drought Impact report Inventory (EDII) can function as a proxy for vulnerability to drought. Multivariable logistic regression is then applied to find non-subjective combinations of drought indices and vulnerability factors to predict the likelihood of drought impact occurrence. The Combined Drought Indicator (CDI) of the European Drought Observatory, SPI and SPEI (1-36) are considered as drought indices; vulnerability factors are gathered from quantitative and qualitative data of statistical databases (e.g. Eurostat, Aquastat). Thus, sector- specific drought risk maps for selected hazard levels were developed for Europe. This work reconsiders the practice of current research philosophies and highlights the importance to detect vulnerability by its symptoms.