



The challenges of empirical impact prediction with monitored drought indices

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Drought monitoring and early warning still relies primarily on drought indicators selected or combined from hydro-meteorological variables, such as precipitation, modeled soil moisture, observed or modeled streamflow, and in some cases remotely sensed vegetation health. To guide the selection and give these indices more meaning for drought management decisions, a number of studies have investigated empirically the linkage between these indices and records of drought impact occurrence. These studies have been inspired by the damage function approach employed in risk assessments of other natural hazards. In this contribution we systematically review and assess the feasibility of finding impact-indicator link functions suitable for prediction. Impact information was derived from large archives of text-based, coded impact reports, such as the European Drought Impact report Inventory and the US Drought Impact Reporter and link functions were analyzed at various spatial scales for various subsets of impact types and drought events. The identified challenges include the rapid decrease of data when subsetting for specific impact sectors or smaller spatial areas, the choice of the link model, and a variety of potential dynamic changes to the underlying conditions between and even during drought events. Based on the assessment, recommendations for a successful and applicable link model include in particular a careful pre-processing of index and impact data and more systematic impact data collection in the future.