Global reanalysis datasets for flood event identification in a data sparse environment: the case study of Southern Africa

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Despite increases in the quantity, quality and coverage of meteorological data, there remain regions which due to low capacity, understanding or access are unable to use this data effectively. Southern Africa is such region that is not only data sparse, but suffers acute adverse effects from climatology such as floods and droughts. Novel global datasets have the potential to provide hydro-meteorological data of sufficient quality to these areas. However these datasets are not yet extensively validated and their suitability to capture the regional climatic variability are not well understood. This research critically assesses the potential for flood event identification using the Water Resources Reanalysis (WRR) dataset developed in the European Union's Seventh Framework Programme eartH2Observe project. The study area is the data sparse and flood vulnerable Limpopo River Basin. The discharge outputs of several global hydrological models as well as land surface models are compared against two benchmarks; discharge observations and flood event reporting. This study demonstrates the applicability of global datasets in this data sparse environment in order to capture the magnitude of impacting flood events. Since global models such as those included in the WRR dataset are also used by large-scale flood forecasting systems, this research gives an insight in the information that could be used for local-scale flood risk applications.