



A simple satellite and model based index for forecasting large-scale flood inundation in data-poor regions

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Flood inundation poses a major risk to many populated areas around the world. Despite the economic losses and the devastating societal impacts floods have, low frequency, high magnitude events are still poorly monitored, modelled and predicted in many areas across the globe, especially in data-poor regions of the developing world. In these areas, satellite observations and large scale coupled hydrologic-hydrodynamic models are currently the only option to help understand and predict high magnitude flood events. To contribute to these ongoing efforts, this paper presents a simple index for forecasting large-scale flood inundation in data poor regions. Based on a test case in the Lower Zambezi basin (Mozambique), we demonstrate how satellite data, specifically data from the upcoming SMAP mission can be used in conjunction with meteorological forecast data and outputs from a coupled hydrologic-hydrodynamic (VIC-LISFLOOD-FP) model of the region to build up meaningful correlations between rainfall, antecedent soil moisture and simulated flood inundation variables. Along with the data, these correlations can then be used to build up a long term look-up catalogue to develop a simple flood forecast index. Our project illustrates that this index can be applied to forecast flood inundation based on forecast rainfall and observed antecedent soil moisture without the need to run a model.