



The sensitivity of water availability to aridity changes and other factors - a probabilistic analysis in the Budyko-space

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One of the pending questions in the context of global change is (i) whether climatic drivers or (ii) other factors have a stronger influence on water availability. Here we present an idealised approach that allows to estimate the probability that changes in climatological aridity have a larger effect on water availability than other factors. The analysis builds upon a probabilistic extension of the Budyko framework, which is subject to an analytical sensitivity assessment. The results show that changes in water availability are dominated by changes in the aridity index in humid climates. In arid climates other factors are dominating. A global application predicts only little influence of aridity changes on water availability in drylands. This implies that the projected intensification of aridity in dry regions may have less influence on water availability than commonly assumed. Instead other factors, including e.g. land use change, are likely dominating.