



Vegetation response to rainfall intermittency in drylands: Results from a simple ecohydrological box model

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Abstract.

Vegetation in arid and semi-arid regions is affected by intermittent water availability. We discuss a simple stochastic model describing the coupled dynamics of soil moisture and vegetation, and study the effects of rainfall intermittency. Soil moisture dynamics is described by a ecohydrological box model, while vegetation is represented by site occupancy dynamics in a spatially-implicit model. We show that temporal rainfall intermittency allows for vegetation persistence at low values of annual rainfall volume, whereas it would go extinct if rainfall were constant. Rainfall intermittency also generates long-term fluctuations in vegetation cover, even in the absence of significant inter-annual variations in the statistical properties of precipitation.