



Understanding the link between aridity and rainfall intermittency

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Intermittency – both in space and time – is a distinctive characteristic of precipitation throughout arid climates, being intimately related to the local availability of water and energy as well as to the climatology of large-scale weather systems that sporadically hit these areas. Clustering, large fluctuations and long quiescent dry phases (i.e. droughts) represent in fact a major climatic forcing, shaping and driving the ecosystems and the sustainable development of arid regions.

However, to understand the link between aridity and rainfall variability is not only crucial for a full grasp of the climate dynamics of arid regions, but also to understand and predict global precipitation trends under global warming and aridification.

In this contribution we analyze the connection between rainfall intermittency, its temporal scaling laws and aridity in a climatological prospective. Through a wide data-set of precipitation time series covering most Continental US we explore the local dependence of classic intermittency measures on aridity, finding evidence of a well-defined variability patterns across a wide range of water-limited climates. We also explore the connection between different intermittency features of arid climates as contrasted with “wet” regions and briefly discuss the links between clustering, water-availability thresholds and hydro-climatic extremes. Our findings provide a framework to better understand the link between intermittency, hydrological extremes and climate in water-limited regions of the world, with possible extension to global aridification studies.