



Role of flow variability on the riparian vegetation dynamics

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Riparian vegetation is one of the most rich, fragile and sensitive to anthropic disturbances ecotone. The ecological literature on this topic has always underlined the key role of the river discharge in influencing the riparian vegetation dynamics. However, although randomness is a fundamental characteristic of river hydrology, nowadays quantitative vegetation models taking into account the random nature of river discharge are not available. We propose a model where the dynamics of riparian vegetation are randomly forced by river discharge variations. The model is solved and the analytical expressions of probability density function of vegetation biomass and its first moments are obtained. These theoretical results allow to study the links between river hydrology and distribution of vegetation along the riparian transect. In particular, the influence of the type of riparian species and the statistical characteristics of discharge time series are highlighted. Finally, positive comparisons with real data are made.