



Modeling the Interactions between Hydrological Extremes, Water Management and Society.

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Over the past years, several studies have focused on exploring human impacts on the hydrological regime. Even though the dominant hydrological processes are mostly well understood, there are still several challenges related to modeling the coevolution of human impacts on (and responses to) hydrological extremes, such as floods and droughts. Some initial modeling attempts have proved to capture the essential dynamics emerging from two-way feedbacks between hydrological and social processes. However, they have predominantly focused on flooding. This research aims to develop a new conceptual model unraveling the interplay between hydrological extremes (floods and droughts) and human societies in a changing climate. In particular, this socio-hydrological model aims at understanding, and predicting the dynamics of coupled human-water systems to explain and capture how the occurrence of hydrological extremes changes water management approach, and how such a change (in turn) mitigates the impacts of hydrological extremes. The conceptual model is then applied to a case study to test its ability in simulating the dynamics emerging from the interplay between hydrological and social processes.