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Unsolved problems in hydrology: societal responses to unprecedented events

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Understanding how different societal groups respond to drought or flood events is one of the unsolved problems in hydrology (UPH), concerning the interfaces with society. More specifically, there is a need to decipher the relationship between potential impacts of unprecedented events, distribution of sociohydrological risk as well as future adaptation and recovery trajectories. In this presentation, we introduce a new analytical approach to answer the question of how contemporary societies might adapt to and recover from unprecedented drought and flood events in an inclusive and sustainable fashion. In doing so, this presentation deepens our understandings of the interface between hydrological extremes and society. Addressing this question requires creating new forms of knowledge that integrate analyses of the past, i.e. historical and political processes of risk and adaptation and the underlying power relations, with hydroclimatic projections of unprecedented events. We thus combine three aspects which have been studied individually, but never integrated: a. scenarios based on social science theories on disaster management; b. case studies of past hydroclimatic events which were unprecedented at the time of their occurrence; c. conceptual transfer across case studies - that is, learning something about potential future unprecedented events at one location by leveraging events which occurred elsewhere. Some of the scenarios developed may already be emerging in current times, whilst others are plausible hypotheses in humanity's future space. This approach, at the nexus between social and hydrological sciences, has the concrete advantage of providing an impacts-focused vision of future risk, beyond what is achievable within conventional disciplinary boundaries.