



Flood risk changes emerging from the feedbacks between physical and social processes

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To explore changes in flood risk, we propose a novel approach whereby the mutual interactions and continuous feedbacks between floods and societies are explicitly accounted for. We apply this approach by using a socio-hydrological model and simulate the behavior of societies that cope with flooding by either building levees or dikes or resettling out of flood-prone areas. We show that this novel approach is able to capture (and explain) spontaneous dynamics, such as adaptation and levee effects, which often emerge from the interplay between physical and social processes. Moreover, the implementation of this approach provides fascinating insights for flood risk management. For instance, when coupled dynamics are accounted for, flood-poor periods can be more dangerous for societies than flood-rich periods because they lower the collective memory of flooding and therefore reduce societal resilience to flooding.