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Longitudinal Survey Data Call For Diversifying Temporal Dynamics In Modelling Human-Water Systems

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Numerous scholars have unravelled the complexities and underlying uncertainties of coupled human and water systems in various fields and disciplines. These complexities, however, are not always reflected in the way in which the dynamics of human-water systems are modelled. One reason is the lack of social data times series, that may be provided by longitudinal surveys. Here, we show the value of collecting longitudinal survey data to enrich sociohydrological modelling of flood risk. To illustrate, we compare and contrast two different approaches (repeated cross-sectional and panel) for collecting longitudinal data, and explore changes in flood risk awareness and preparedness in a municipality hit by a flash flood in 2018. We found that risk awareness has not changed significantly in the timeframe under study (one year). Perceived preparedness also did not change, but we observed differences related to damage severity. More precisely, preparedness increased only among those respondents who suffered low damages during the flood event. We also found gender differences across both approaches for most of the variables explored. Lastly, we argue that results that are consistent across the two approaches constitute robust data that can be used for the parametrisation of sociohydrological models. Moreover, we posit that there is a need to improve socio-demographic heterogeneity in modelling human-water systems in order to better support risk management.