



## **Floods of a warmer world: learning from the last interglacial**

Paolo Scussolini (1), Philip Ward (1), Pepijn Bakker (2), Jeroen Aerts (1), Hans Rensen (3), Ted Veldkamp (1), and Dim Coumou (1)

(1) Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam, Netherlands, (2) Centre for Marine Environmental Sciences (MARUM), Bremen, Germany, (3) University College of Southeast Norway, Bø, Norway

In a warmer world, the hydrological cycle will change in intensity and in its geographic behaviour. This, in turn, will change patterns of river flood and the risk associated with them. The Last Interglacial (LIG; 125,000 years ago) is the most recent instance of climate warmer than today - especially in the high northern latitudes-, sea level was higher, ice sheets were smaller and monsoons were stronger. We use daily output from multi-century LIG simulations of an ensemble of paleoclimate models, and study how global precipitation patterns and extremes deviate from the preindustrial climate. We validate these results by comparing them with the first compilation, to our knowledge, of global LIG precipitation patterns. Successively, we use the daily temperature and precipitation from the paleoclimate models to drive two global hydrological models (PCR-GLOBWB and CWATM), and simulate river discharges at 5-30' resolution. With this, we force a hydrodynamic model, CaMa-Flood, and produce floods maps for different return periods. At the end of this model cascade, we look into what would happen if a climate similar to the LIG were to materialize in the coming decades: we combine the flood maps with maps of exposure through vulnerability relationships, and to calculate the risk that floods may pose to future people and assets.