



A flood inundation climatology for Europe

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Floods have been one of the major natural hazard problems in Europe for many centuries. With the appearance of computationally efficient floodplain hydraulic models, it is now possible to reconstruct and analyse specific past flood events over large domains. However, a flood climatology for major rivers in Europe is still missing. Here we present, an automated framework to create such climatology based on a linkage between LISFLOOD-FP, a floodplain inundation model, and Lisflood, a hydrological model, to create a continuous long-term flood simulation for Europe at 1 Km resolution. The creation of this framework is enabled by the development of LFPtools, a software suite to easily and quickly prepare large scale LISFLOOD-FP models using freely available data.

The simulated flood climatology data set covers the period 1990 – 2014 at daily time step and is produced under two scenarios. First, a naturalised scenario where no flood protection standards are considered. Second, a protected scenario where the impact of known and assumed flood defences are included. The simulated climatology data set is compared against observed flows in addition to satellite imagery for calibration and validation purposes. The analysis of the hindcast will consider several flood inundation variables such as floodplain extent, volume, storage and streamflow, and will reveal the effectiveness of the flood protection standards applied in European countries exposed to high flood risk.