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Temporal dynamics of a jökulhlaup system

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Subglacial outburst floods from the ice-dammed Merzbacher Lake in the Tian Shan have occurred roughly every year since the 1950s, with recorded peak discharges in China reaching $\sim$2000 m^3 s^{-1}. Motivated by such records, we have formulated a theoretical model of lake refilling and drainage to study how changing climate paces the outbursts, and the character of flood initiation. We found that even a low-order model can explain key aspects of the observed flood-date series from Merzbacher Lake. By analysing the nonlinear dynamics of the model, we also derived some general insights on jökulhlaup-lakes that may help us understand the complex pattern of flood timing in such systems.