# A Socio-hydrological flood model for the Elbe

Alberto Viglione (1), Marlies Barendrecht (1), Heidi Kreibich (2), Sergiy Vorogushyn (2), Bruno Merz (2), and Guenter Bloeschl (1)

(1) Vienna University of Technology, Institute of Hydraulic Engineering and Water Resources Management, Vienna, Austria (viglione@hydro.tuwien.ac.at), (2) GeoForschungsZentrum Potsdam (GFZ), Section Engineering Hydrology, Telegrafenberg, Potsdam, Germany

Long-term feedbacks between humans and floods may lead to complex phenomena such as coping strategies, levee effects, call effects, adaptation effects, and poverty traps. Dynamic coupled human-flood models are a promising tool to represent such phenomena and the feedbacks leading to them. These socio-hydrological models may play an important role in integrated flood risk management when they are applied to real world case studies. They can help develop hypotheses about the phenomena that have been observed in the case study of interest, by describing the interactions between the social and hydrological variables as well as other relevant variables, such as economic, environmental, political or technical, that play a role in the system.

We discuss the case of Dresden where the 2002 flood, which was preceded by a period without floods but was less severe, resulted in a higher damage than the 2013 flood, which was preceded by the 2002 flood and a couple of less severe floods. The lower damage in 2013 may be explained by the fact that society has become aware of the flood risk and has adapted to it. Developing and applying a socio-hydrological flood model to the case of Dresden can help discover whether it is possible that the lower damage is caused by an adaptation effect, or if there are other feedbacks that can explain the observed phenomenon.