

4A4 Understanding of floods on regional scale: aggravating pathways, vulnerability, and adaptive capacity – A case study for Oberland Region (Upper Bavaria), Germany**Dr. Gamze Koç¹, Dr. Anne von Streit², Annika Schubert², Prof. Dr. Matthias Garschagen²**¹ *Urbane und Öko-Klimatologie, Karlsruher Institut für Technologie (KIT)*² *Department für Geographie, Ludwig-Maximilians-Universität München (LMU)*

Upper Bavaria has comparatively higher mean rainfall amounts than other regions in Germany. At the same time, it is one of the regions in Germany with the highest frequency of heavy rainfall events due to its geographical location close to the Alps. Especially heavy rainfall events cause severe human and economic impacts in the region. In a warming climate, heavy rainfall is assumed to occur even more frequently in the future. However, extreme rainfall events are hard to observe and predict which poses great challenges for planning authorities and civil protection (emergency services). The project KARE (1) (Designing measures for climate change adaptation and risk management at the regional scale: the case of heavy precipitation events) is a three-year transdisciplinary research endeavor with the aim to improve the reliability of climate model simulation on a regional scale as well as to develop and test knowledge-based solutions for municipal and regional climate risk management and adaptation with a special focus on heavy precipitation events. The project is using four counties south of Munich in Upper Bavaria as a pilot region. A first analysis of precipitation patterns (i.e. intensity, duration, etc.) as well as fire brigade operation data as a proxy for damages for this region has shown that similar rainfall patterns cause different impacts in different districts of the Oberland region.

Therefore, our aim is to understand the different aggravating pathways of heavy rainfall events in Oberland resulting from physical as well as social factors. Firstly, flood-aggravating pathways such as topographic features, land use types, drainage characteristics and soil infiltration properties of the events in Oberland between the years from 2010 to 2020 will be analyzed. To determine the dominant influencing mechanisms, aggravating pathway factors will be classified for the study area. The classification results will be compared with the heavy rainfall events defined by the German Weather Service (DWD), Catalogue of Radar-based Heavy Rainfall Events (CatRaRE catalogue) in terms of precipitation duration and amount. As the physical factors alone cannot explain divergent damage patterns, these results will be enriched with household survey data on exposition, vulnerability and adaptive capacity as a second step. The outcomes of this study could provide beneficial information on different aggravating mechanisms in different districts in Oberland and could be used for future land-use planning, risk management as well as vulnerability and regional flood risk studies. (1) KARE - Klimaanpassung auf regionaler Ebene is funded by the German Federal Ministry of Education and Research (BMBF), 01LR2006B: <https://klimaanpassung-oberland.de/>