

The regional risk perception of extreme weather events: The example hail in Germany

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Motivation

Damages to buildings, infrastructure and even human life caused by extreme weather events have significantly increased during the last decades. This has happened due to the interaction of several factors such as increases in assets, increases in vulnerability of infrastructure and people, or changes in patterns and the frequency of extreme events. Seen from a social perspective, this increase is basically connected to and framed as a direct consequence of global warming. Hence, extreme weather events such as heavy hailstorms are phenomena, which call for an inclusion of the social dimensions in the context of reliable mitigation and adaptation measures and risk actions to be taken in the case of extreme events.

Within the frame of the **interdisciplinary project “Regional risk cultures of weather extremes”**, scientists from different disciplines such as meteorology, sociology, and economics merge their conceptual and methodological expertise to investigate hazardous weather events (HWE) from an integrated perspective. Emphasis is put on the **social perception and assessment of HWE** as well as on actions taken regarding HWE such as heat waves, floods, winter storms, storm surges, and – in the present context – hail. The **aim of the project** consists in gaining a **better and regionalized understanding of the societal and cultural dimensions of risk** in the context of HWE.

Research question and aims

In the project, we address the following **research questions** concerning **hazardous weather events (HWE)**:

- ✗ How are HWE perceived, explained and evaluated?
- ✗ What role does climate change play in the interpretation of HWE?
- ✗ What are the regional differences between risk perception, assessment and action in relation to experience and knowledge about an HWE?
- ✗ What protective measures have been, are or will be taken, and why?
- ✗ Can regional-specific risk cultures be identified and how are they structured?

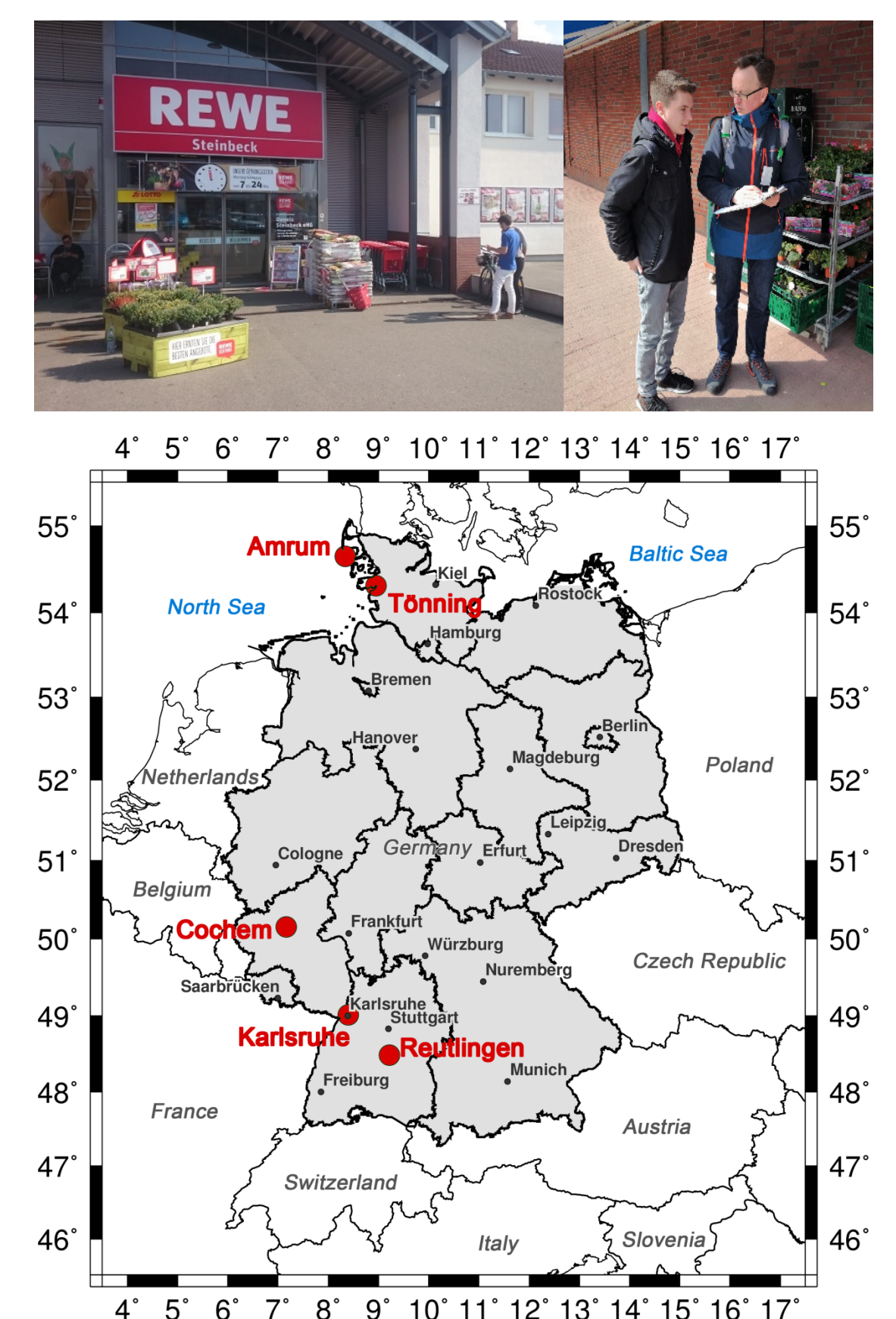
Methods applied

In **Germany**, we have conducted quantitative **street surveys** at different locations specifically affected by certain types of HWE in Germany:

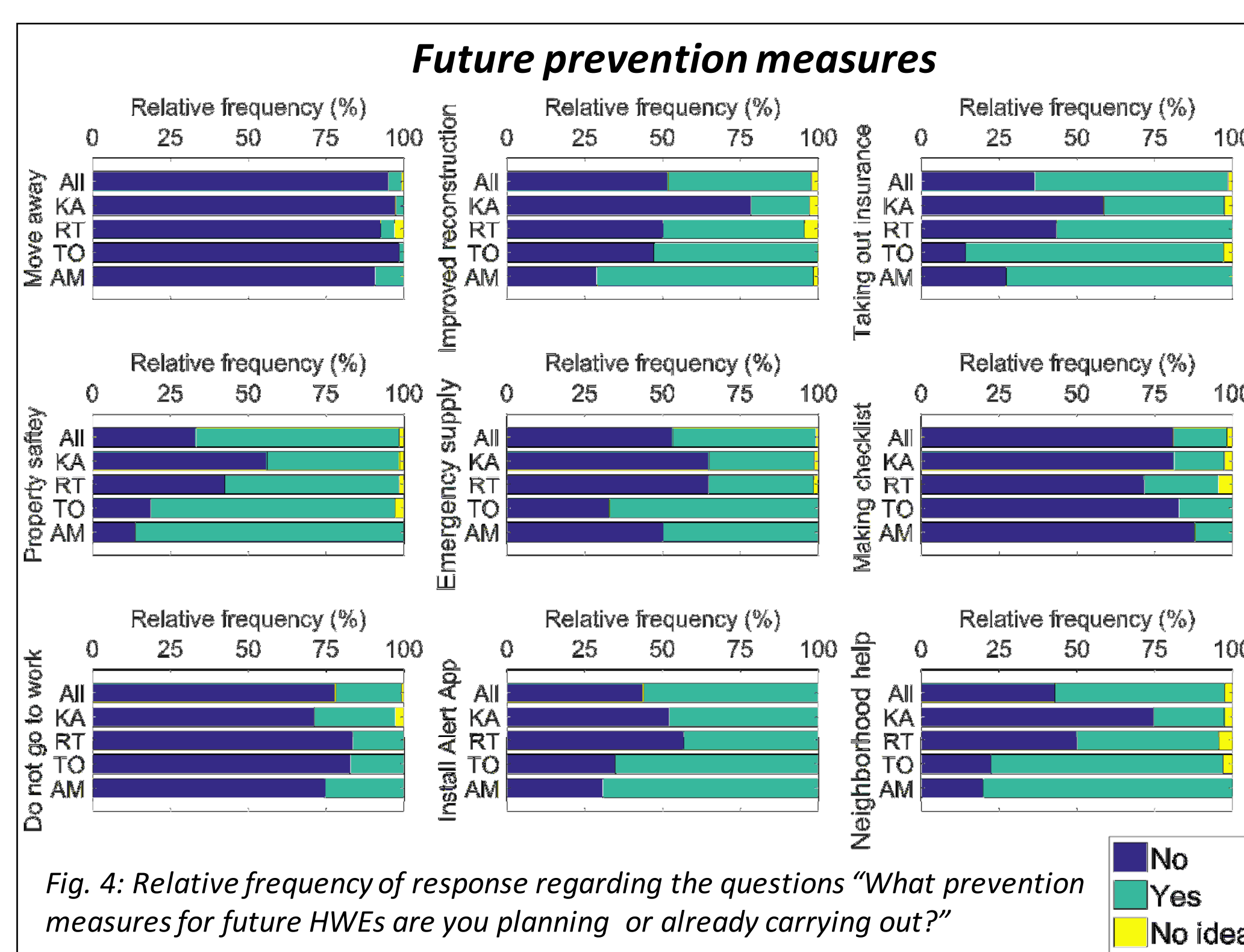
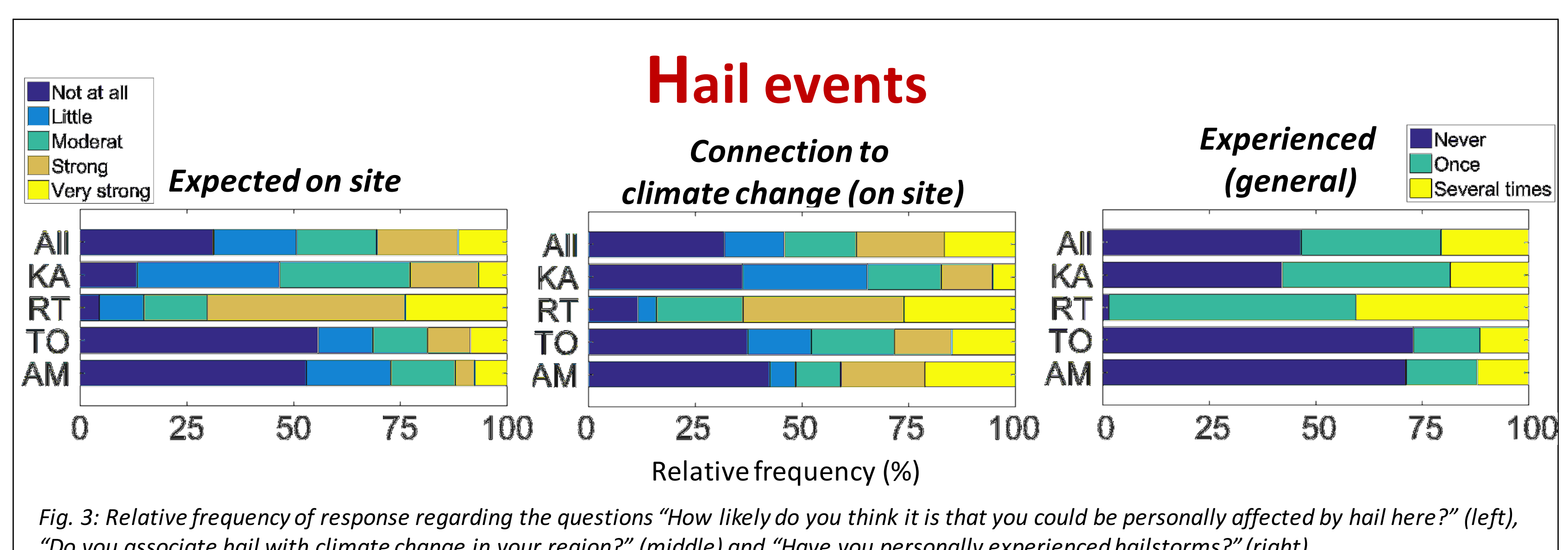
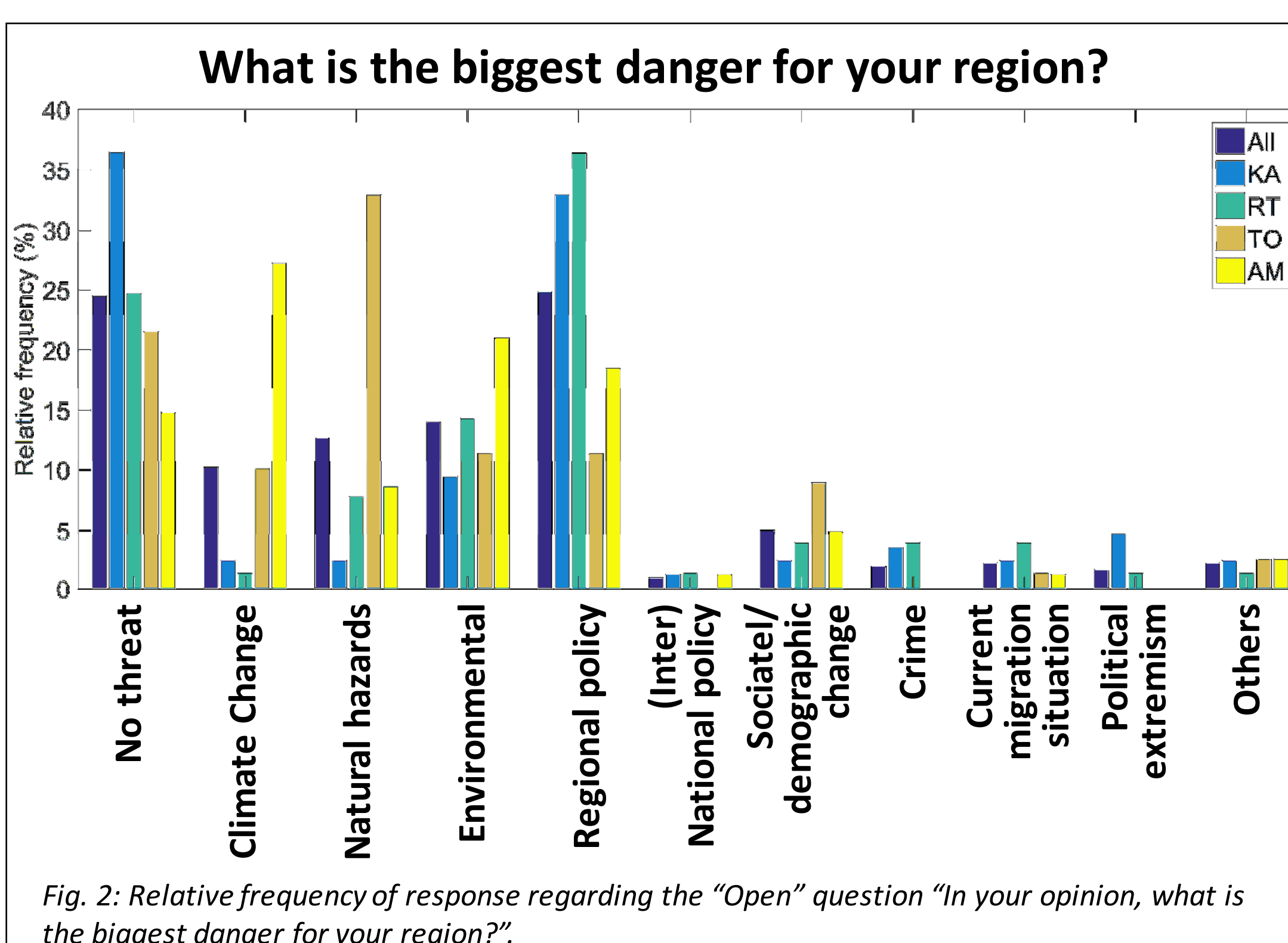
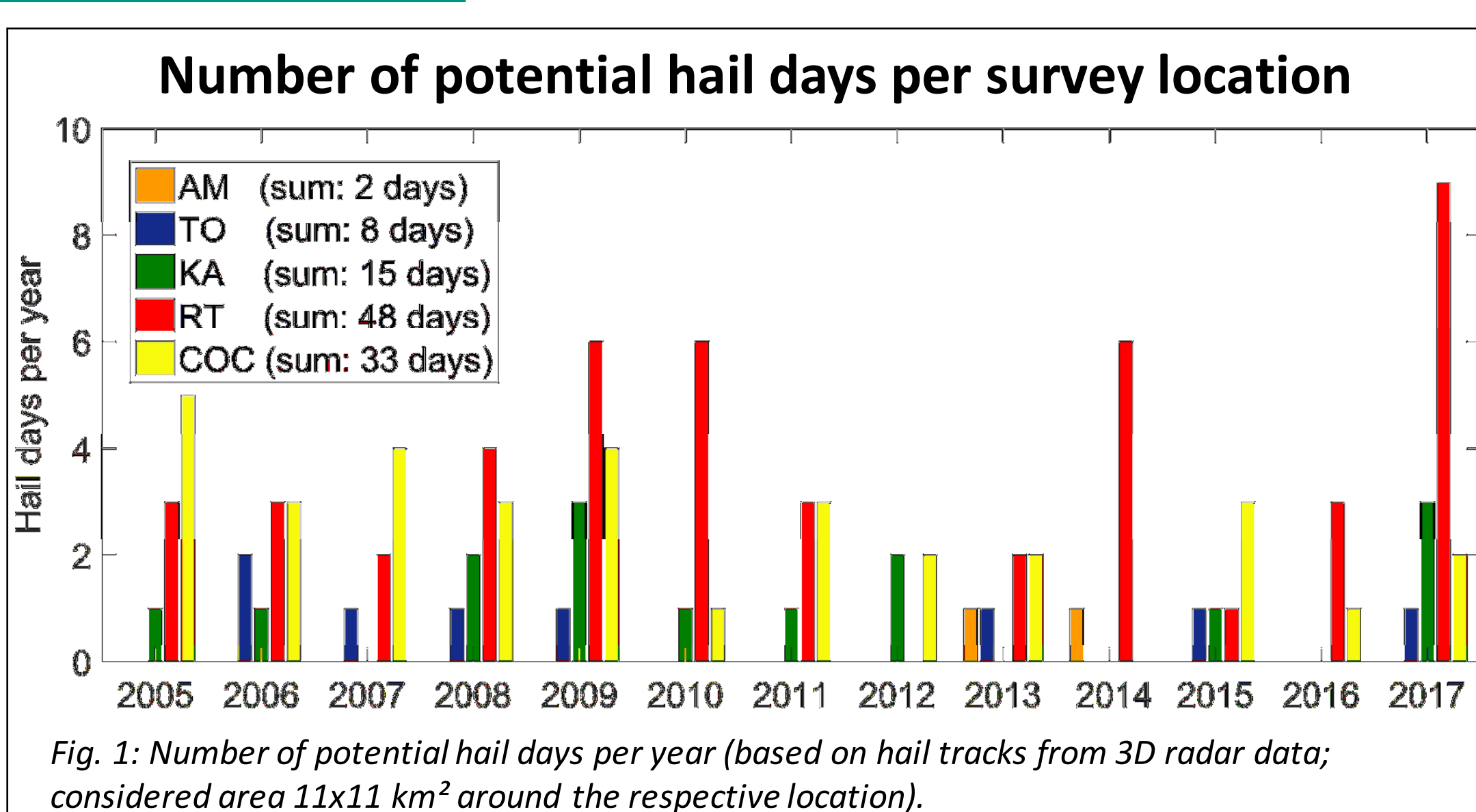
- ✗ **RT: Reutlingen (hail storms)**
- ✗ **KA: Karlsruhe (heat waves)**
- ✗ **TO: Tönning (storms, storm surges)**
- ✗ **AM: Island of Amrum in the North Sea (storms, storm surges)**
- ✗ **COC: Cochem on the Moselle river (floods)**

These will be correlated with climate data of the German Weather Service (DWD) and other meteorological parameters describing the climatological background of the respective weather extremes on site.

Regarding **hail events**, we used potential hail days between 2005 – 2017, which based on 3D radar data (Schmidberger, 2018).



First results



Provisional conclusions

- ✗ The experience of HWEs plays a relevant role for perceiving and assessing specific dangers and risks on a local and regional level.
- ✗ The same applies to establishing a link between HWE and climate change.
- ✗ The severity of the event is important for the perception and, thus, relevant by the interpretation of the results.
- ✗ The actions taken regarding HWE is (often) similar between the regions (and, thus, between HWEs).