



Weather myths about convective storms: an objective assessment of their validity and their psychological basis

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There exist several myths about convective weather, like "thunderstorms don't cross this river", "thunderstorms are deflected/dissolved by large cities" etc. . Observations are one source and "proof" of such myths, which might influence the decision making process in forecasters and forecast users. This study investigates the validity of some weather myths and explores a climatology of convective storms.

Convective cell detection and tracking systems based on radar reflectivity measurements are used in nowcasting. Such a system, KONRAD ("KONvektionsentwicklung in Radarprodukten", convection evolution in radar products), is provided to German fire departments. This thunderstorm diagnosis and forecast system facilitates decision making of emergency managers in preparation of convective weather hazards. The analysis domain covers Germany and surrounding areas. A seven year data set from KONRAD can provide an insight into the characteristics of convective storms. General characteristics comprise for instance an exponential distribution of the lifetime of cells. As expected, spatial frequency of cells shows maxima over the mountainous regions. In all regions cells move predominantly north eastwards. There is a positive relationship between the life time and the probability for hail from a cell.

An automated technique was developed, which evaluates the tracks of convective cells by their curvature. The tracks in the small domain surrounding Berlin and in a reference area were analysed. The investigation of the myth "thunderstorms don't reach Berlin" shows that slightly more than half of the tracks which approach Berlin, do not reach the metropolitan area. This result does not show a significant difference to the rest of Germany. Additionally, most tracks are not straight (within $\pm 5^\circ$), but curve slightly right or left, which is also compatible with the results for the whole of Germany. This means, that the cells that approach Berlin, do not exhibit significant differences to other cells in their track behavior. In comparison to the leftmovers, rightmovers show a larger and more variable curvature.

Quantitative determination of the validity of weather myths allows more objective assessment of risk in nowcasting. To understand the origin and survival of these myths one also has to look at the psychological processes that may determine which events are remembered, e.g. the availability heuristic, or how new information is learned and interpreted in the first place.