

Gewitter in Deutschland und die öffentliche Wahrnehmung des Risikos

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Thunderstorms pose a significant risk for life, property and economy. Detailed knowledge of their characteristics and when they occur is thus essential for the public to anticipate risks and respond appropriately.

We present a multi-year analysis (using measurements from the German weather radar network and a lightning location system) of thunderstorm occurrence and characteristics, and contrast it with the perception of thunderstorms by the German public tested in a representative study.

Thunderstorms occur most often in the pre-alpine region of southern Germany; further local maxima exist in low mountain ranges. Despite a high year-to-year variability of thunderstorm activity, on average a clear annual cycle (maximum June to August) and diurnal cycle (maximum in the afternoon) is present. The annual cycle of lightning is varying geographically, e.g. offshore and coastal regions show lower amplitude of the annual cycle and a later maximum (autumn) compared to inland (mountainous) regions. The average annual lightning rate is between 0.5 and 20 per km².

While stationary cells might lead to excessive rain on small spatial scales, supercells (convective storms with a rotating updraft, which often produce hail or even tornados) tend to propagate faster than ordinary thunderstorms. Thus, people may be caught by surprise if they underestimate the speed of thunderstorms or the time a presumable “harmless” cumulus cloud needs to evolve into a deep convective thunderstorm. Although almost 80% of the study respondents were aware that thunderstorms can travel and evolve fast, about 50% were unaware that lightning can strike even 10 km away from the storm. Moreover, about 40% overestimated the distance to a thunderstorm based on the gap between lightning and thunder, and may not seek shelter in time in critical situations.