Geophysical Research Abstracts
Vol. 21, EGU2019-14708, 2019
EGU General Assembly 2019

A Hail Storm Climatology for Switzerland

Katharina Schroeer, Simona Trefalt, Cornelia Schwierz, Urs Germann, Alessandro Hering, and Luca Nisi
Federal Office of Meteorology and Climatology MeteoSwiss, Switzerland (katharina.schroeer@meteoswiss.ch)

Worldwide, hail storms regularly damage cars and infrastructure. Even small hail stones can ruin entire harvests in no time. With annual costs of several hundred millions of Euros, hail is among the costliest natural hazards in Switzerland. The localized and chaotic nature of hail storms poses a significant challenge to forecasters, insurers, and risk managers. Climate change might exacerbate the intensity of convective storms, but climatological studies on hail storms are still hampered by a lack of long-term and spatially coherent data. In the Alpine region, the complex topography and climatic contrast between northern and southern flanks make research on severe convective storms in Switzerland particularly challenging.
A new generation of observations at high spatio-temporal resolution (1 km^2, 5 min) from the weather radar network operated by MeteoSwiss offers a high-quality, area-covering database to assess the frequency and intensity of hail events in Switzerland. Building on Nisi et al. (2016) and Nisi et al. (2018), this study presents an extended and updated climatology of the characteristics and distribution of hail storms in Switzerland for the period 2002 - 2018. Empirical radar-derived parameters of Probability of Hail (POH) and Maximum Expected Severe Hail Size (MESHS) are used to identify hotspots of hail activity as well as to estimate the risk of large hail stone occurrence. Furthermore, data from a radar-based storm tracking algorithm (Thunderstorm Radar Tracking TRT) allows estimation of the size, lifetime, and trajectories of individual hail storms. The climatology of these events provides valuable information on the regional-to-local scale peculiarities of hail, and can be useful to evaluate larger-scale, environmental approaches.
The presented work is part of the project “National Hail Climatology Switzerland”, in which scientists and stakeholders work together to generate a novel, consistent, spatially and temporally differentiated hail climatology for Switzerland. The aim is to advance our climatological understanding of highly heterogeneous hail storm occurrence as well as to create and provide ready-to-use maps and data for various applications in risk management and damage prevention.

References:
Nisi et al. (2016): Spatial and temporal distribution of hailstorms in the Alpine region: A long-term, high resolution, radar-based analysis. Quarterly Journal of the Royal Meteorological Society 142 (697) DOI: 10.1002/qj.2771
Nisi et al. (2018): A 15-year hail streak climatology for the Alpine region. Quarterly Journal of the Royal Meteorological Society 144 (714) DOI: 10.1002/qj.3286