Application of crowdsourced hail data and damage information for hail risk assessment in the province of Styria, Austria

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Hail storm damage is a major concern to the farmers in the province of Styria, Austria. Each year severe hail storms are causing damages to crops, resulting in losses of millions of euros. High spatial and timely ground truth information of the hail event and crop damage measurements are essential for better hail risk assessment. Usually, hail pad networks and visual damage surveys are used to collect the hail data and corresponding damage information. However, these hail pad networks are expensive and need laborious maintenance. The traditional crop damage assessment approaches are very labour-intensive and time-consuming. The advancements in information and communication technology (ICT) and the power of citizen based crowdsourcing data, will help to overcome these problems and ultimately provide a platform for data collection. A user-friendly and bilingual web interface was developed to collect hail data and crop damage information in the province of Styria, Austria. The dynamic web interface was developed using HTML5, JavaScript, and PHP7 combined with a MySQL database back-end. OpenStreetMap was integrated into the web interface and tile server optimised for an easy identification of geolocation information. The user needs an internet connection to transfer the data through smartphone or computer. Crowdsourced data will be quality tested and evaluated with 3D single polarisation C-band weather radar data to remove potential false reports. Further, the relationship between the reported hail events and radar-based hail detection algorithms (Waldvogel and Auer) and derived hail signature information intended for crop hail risk assessment will be investigated. The details about the web interface tool, application and verification methods to collect, analyse, and integrate different data sets are given. Further, the high spatial risk assessment information is communicated to support risk management policy.