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# Citizen observations via the RMI smartphone app in Belgium: data collection and applications

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To enhance meteorological data collection and nowcasting capabilities, the Royal Meteorological Institute (RMI) of Belgium integrated a citizen observation feature into its smartphone app in August 2019. This initiative has since accumulated over 3.3 million observations, including 56,000 user-submitted photos, significantly enriching RMI's meteorological datasets.

While the majority of user reports capture more general weather conditions such as sunny, overcast skies, or rain, the most valuable contributions focus on key weather phenomena like snow, hail, thunderstorms, and road conditions, providing real-time, localized insights. Each observation undergoes a plausibility check based on timestamp, location, and content, ensuring data reliability. A user reputation system further refines data quality, with 78% of users maintaining a reputation score of 90 or higher on a scale of 0 to 100.

This dataset has proven valuable for multiple applications at RMI, including the validation of weather radar estimates for hail detection, improving snow height model forecasts, and enhancing crisis response mechanisms. Specifically, citizen observations have been leveraged by regional hydrological and road management authorities for real-time flood monitoring and hazardous road condition assessments, respectively.

The integration of citizen observations into meteorological workflows marks a significant advancement in data collection, bridging gaps in traditional sensor networks and enabling better forecasting models. As the RMI continues to refine its methodologies, this approach holds promise for expanding the role of crowdsourced meteorological data across Europe.

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