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Human Weather- and Impact-Reports in Austria – A Crucial Support to Mitigate Extreme Weather and Climate Impacts?

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Governments and civil authorities face increasing socio-economic challenges due to extreme weather and climate impacts. Effective decision-making requires robust data on weather- and climate-related hazards and damages, both for immediate warnings and long-term threat assessment.

Weather stations cannot detect hazards like flooding or wind damage, making observations from voluntary observers a valuable "ground truth" data source. This establishes a real-time feedback loop between weather warnings and impact reports, a critical capability for the national weather service GeoSphere Austria (formerly ZAMG) as a key advisor within Austria's National Crisis and Disaster Management (SKKM).

Since 2020, GeoSphere Austria has compiled a national database with nearly 160,000 human weather and impact reports via the web-app wettermelden.at. The app's parameters align with the European Weather Observer App (EWOB) from the European Severe Storms Laboratory (ESSL), enabling standardized, real-time exchange of impact reports between national and European levels via API. The API further allows external partners to interact with the GeoSphere database from their platforms, by their own communities, without the need of using extrinsic platforms, enhancing data integration. These reports also contribute to forensic damage assessments and climate impact research.

Most observers are weather enthusiasts, spotters, storm chasers, ham radio operators, students, and other motivated volunteers. Within the Trusted Spotter Network Austria (TSN) they are offered comprehensive training and regular workshops, facilitating knowledge exchange between citizen scientists and professionals. This program enhances the accuracy and reliability of reports from fully trained "Trusted Spotters."

GeoSphere collaborates with other European National Weather Services to exchange standardized human impact reports during cross-border extreme weather events, serving both warning purposes and scientific research.

GeoSphere maintains a growing network of partners and offers an extensive educational program for schools through the "Wetter-Partner-Schule" initiative, including Citizen Science Awards, webinars, workshops, and scientific information on weather forecasting, hazards, and the climate crisis. For example, Agricultural-Vocational Schools have integrated wettermelden.at into their daily routines.

The Austrian citizen science program wettermelden.at and the Trusted Spotter Network have been recognized for best practices by the European Meteorological Society (EMS) and the World Meteorological Organization (WMO).

