



Severe thunderstorms in a changing climate: Assessing their impact on European transport, in particular aviation

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Transport in general, and aviation in particular, is sensitive to extreme weather events. Severe or even non-severe thunderstorms can become a major hazard to aviation, either by direct damage or by causing delays and flight cancellations. We present an assessment of the present-day severe convective storm occurrence in Europe and an estimation of potential trends to be expected under the influence of climate change. Storm reports from the European Severe Weather Database ESWD (www.eswd.eu) are evaluated for preferred regions of individual convective storm phenomena (like hail or downbursts), their intensities and annual cycles. This present-day hazard mapping is complemented by regional climate model results for the SRES A1B scenario, which allow for a comparison between current and future severe convective storm environments in Europe and resulting trends in the hazard to aviation.

Our investigation contributes to the EU FP7 project EWENT (Extreme weather impacts on European networks of transport, <http://virtual.vtt.fi/virtual/ewent/>), also synthesising results and methods from other severe weather research projects, like RegioExAKT (Regional risk of convective extreme weather events: User-oriented concepts for trend assessment and adaptation, www.regioexakt.de) in Germany.

The ESWD gathers detailed and quality-controlled information on severe weather events (e.g., large hail, heavy precipitation, damaging winds, tornadoes) all over Europe in a uniform data format. It employs a multi-lingual user-interface where the European Severe Storms Laboratory (ESSL, www.essl.org), collaborating national meteorological and hydrological services (NMHS), voluntary observer networks (e.g., Skywarn) and the public can contribute and retrieve observations.