



Assessment of impact indicators for extreme winter phenomena considering critical infrastructure

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Weather and climate extremes have become more common over the last few decades and this trend is likely to continue in the foreseeable future due to climate change. Extreme winter weather events can cause significant damage and failure of critical infrastructure systems such as transport, energy and telecommunication leading to transportation delays and closures, tree and power line damage and power outages.

The probability distribution of extreme weather events can be assessed using a suite of indices. As part of the EU/FP7 project RAIN, we have defined a set of quantitative thresholds to be used as impact indicators for different winter weather phenomena. This procedure enables a European-wide analysis of probabilities of hazardous events in the present and projected future climate. Consideration is given to snowfall, blizzard, freezing rain and crown snow load.

The identification of the threshold values for different weather parameters was based on an impact review collected from literature (scientific articles and professional reports), media reports of hazardous cases from January 2001 until December 2014 and a set of relevant case-studies. Besides, a set of interviews with European-wide stakeholders was also conducted and operators or managers of critical infrastructure were asked for possible impact thresholds for extreme winter events. Since the vulnerability of different critical infrastructure types varies, we defined a two-step threshold system, with one threshold value applicable for transportation and another for the energy and telecommunication infrastructure. Applying the defined criteria, the probabilities of extreme winter events can be assessed Europe-wide in the present and future climate.