

Researchers advise warning systems and preparation to mitigate the effects of extreme weather events

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As well as being a time for celebration, winter in Europe is a time for serious weather. Blizzards, flash floods, hurricanes, heavy snow fall can cause chaos, major disruption, economic loss, and endanger lives.

Because of the reactive nature of the media, preventative measures to

lessen the effects of extreme events are often off the news agenda and therefore, the political agenda. "Each time, the only solutions are retrospective," explains Tom Sheldon, senior press manager at the Science Media Centre.

Part of the problem is that the media look for sound bites that people can understand, and politicians want simple solutions they can discuss in the immediate aftermath of an event. But "scientists and engineers don't have a quick solution and we really struggle to get the complexity of the situation into the public domain," Sheldon says.

The best way to prepare people for [severe weather](#) is when the "sun is shining and not during emergencies," explains Luca Mercalli, president of the Italian Meteorological Society and presenter of TV programs on climate and [weather](#) for RAI, Italy's national public broadcasting company. "Severe weather preparedness is a matter of calm and reflective work, to be repeated and maintained," he explains.

Extreme weather events are, according to Mercalli, defined as "events that exceed current climate statistics as a never occurred or rarely occurred event."

While such events may only occur once in a hundred years on a very local scale, they are not that rare if you look at a country or Europe as a whole, explains Alois Holzer, Director of Operations at the European Severe Storms Laboratory (ESSL). This means that we do have the knowledge to deal with them.

Reviews in Austria, by Holzer, and the UK, for the MET Office, have found that forecasts work best if they are simple and clear – sticking to the main message without too much jargon – and that care should be taken not to issue too many warnings.

Unusual weather events can too easily be classed as extreme, leading to an excess of warnings. Weather service and the media need to work together to bring attention to the really serious situations without overwhelming people, Holzer says. "Thresholds need to be well tuned in order to avoid public over-warning."

Following the MET Office review in 2009/2010, the UK weather service moved away from a system based on issuing warnings when meteorological thresholds are exceeded to a model that focuses on events that are likely to have a significant impact, expecting a significant reduction in the number of warnings.

The European Severe Storms Laboratory is partner on the European RAIN project – Risk Analysis of Infrastructure Networks for Extreme Weather Events – which has accessed severe weather warning systems in Europe and found that despite attempts to unify warnings, systems still vary from country to country and with regards to different hazards

"Some countries are very advanced, others not, and also the philosophies behind warning thresholds differ, which can lead to unpleasant effects at the border between two countries," explains Holzer. "In a given situation, one country puts out warnings, a direct neighbour not, although for example the forecasted wind gusts are higher there."

While forecasting and warning systems are generally good for certain weather hazards – windstorms, heavy rain, river flooding and, to a lesser extent, heavy snowfall – they are poor for others, the analysis found.

Many weather services don't provide warnings for wildfires, large and very large hail, and extreme thunderstorm gusts, and lack forecasting skills in these areas. Tornado forecasting was found to be particularly poor, with very short warning times – sometimes just a matter of minutes.

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