

**AMERICAN METEOROLOGICAL SOCIETY  
NEWS RELEASE**

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**NATURAL HAZARDS ARE MORE COMMON THAN STATISTICS INDICATE**

Does it seem like the 100-year severe weather events are happening more often than every 100 years? That's because they do, according to an analysis published in the American Meteorological Society's February issue of the *Journal of Applied Meteorology and Climatology*.

The analysis done by Lasse Makkonen of the Technical Research Centre of Finland, shows that natural hazards such as hurricanes, floods, earthquakes and snow storms actually occur more often than the statistics indicate.

The return, or reoccurrence, of a potentially catastrophic natural disaster is typically measured using historical data ranked in order – called an extreme value analysis. But this age-old way of measurement actually underestimates the risk when applied in its presently common form.

"The way we estimate the probability of a natural hazard reoccurring is fundamentally wrong unless we can associate the historical extreme events with their correct probabilities," said Makkonen. His research shows that there is only one correct formula to do that, the one used by Emil Gumbel in his classical book "Statistics of Extremes" in 1958.

As an example, according to Makkonen the largest of 50 annual extremes should, in the analysis, be associated with the return period of 51 years instead of values up to 100 years that are given by several presently commonly used formulas and corresponding numerical methods. Such errors can be very dangerous when applied in the structural design, for example.

According to Makkonen, the improper formulas appear in many text books and commercial software as well as many engineering handbooks, governmental recommendations and building codes and must be revised to show a more accurate risk of natural hazards to communities.

The American Meteorological Society ([www.ametsoc.org](http://www.ametsoc.org)) is the nation's leading professional organization for those involved in the atmospheric and related sciences. The Technical Research Centre of Finland, VTT and it is the biggest research organization in Northern Europe and deals with almost all fields of applied science and engineering. For more information see [www.vtt.fi](http://www.vtt.fi)

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**Note to Editors and Assignment Desks:** For PDF or faxed copies of the paper, "Plotting Positions in Extreme Value Analysis" contact Stephanie Kenitzer at (425) 432-2192 or [kenitzer@ametsoc.org](mailto:kenitzer@ametsoc.org) Reporters may contact the author at [Lasse.Makkonen@vtt.fi](mailto:Lasse.Makkonen@vtt.fi)