

# What Causes Extreme Hail, Tornadoes, and Floods in South America?

A study of extreme weather in South America shows seasonal and spatial patterns, which, if better understood, could help save lives and minimize damage to property.



An aerial view of a flood-prone river in the foothills of the Andes near San Miguel de Tucuman, Argentina. Credit: Kristen Rasmussen

By [Shannon Palus](#) © 11 May 2015

Subtropical South America is host to a tornado alley in the Pampas lowlands, flash floods in the

Andes foothills, and the highest frequency of large hail ( $\geq 2.5$  centimeters in diameter) in the world. Their cause is clear: The region is home to some of the world's deepest convective storms, which are triggered in proximity to the Andes and driven by heat and moisture arriving from Amazonia. Improved forecasting of the factors that lead to headline-making, disruptive natural events is needed.

[Rasmussen et al.](http://onlinelibrary.wiley.com/doi/10.1002/2014GL061767/abstract) (<http://onlinelibrary.wiley.com/doi/10.1002/2014GL061767/abstract>) advocate that understanding and predicting these [extreme weather events](#) ([http://usatoday30.usatoday.com/weather/storms/2009-09-08-south-america-storms\\_N.htm](http://usatoday30.usatoday.com/weather/storms/2009-09-08-south-america-storms_N.htm)) is important for economic security and public safety of this region. In a new paper, the authors used local media reports of tornadoes, floods, and hail, combined with more than a decade of satellite radar data on atmospheric precipitation systems and lightning sensor data. They mapped the climatology of lightning and then calculated the average lightning flash rates within deep convective cores. They also mapped the instances of extreme weather, as reported in Argentina and Uruguay newspapers, creating the first systematic summary of extreme weather reports in the region.

Combined, the maps of convective storms and local effects reveal several seasonal and spatial patterns. For example, the tornado alley over the Pampas is not where the high frequency of hail occurs. Summer flash floods are usually associated with larger-scale storms. The authors say greater understanding and forecasting of these South American weather events could be vital to saving lives and minimizing damage to property. (*Geophysical Research Letters*, [doi:10.1002/2014GL061767](https://doi.org/10.1002/2014GL061767) (<http://onlinelibrary.wiley.com/doi/10.1002/2014GL061767/abstract>), 2014)

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