

# Human activities found to be contributing to an increase in extreme rainfall events in North America

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A pair of researchers with Climate Research Division, Environment and Climate Change in Canada has found evidence that shows human

activities have been contributing to an increase in extreme rainfall events in North America. In their paper published in *Proceedings of the National Academy of Sciences*, Megan Kirchmeier-Young and Xuebin Zhang describe their study, which involved an analysis of climate data and use of computer models to demonstrate the impact of global warming on extreme rainfall events across North America.

Extreme [rainfall](#) events are defined as occasions when the amount of rain over a given period of time is higher than normal. Receiving 36 inches of rain in one day most anywhere in North America, for example, would be considered abnormal. Other extreme events can occur when it rains heavily for multiple days in a row. Both cases can lead to flooding in communities as the rain arrives faster than it can be channeled into storm drains. Notably, most extreme rainfall events are tied to major weather events, such as hurricanes or tropical storms.

But there are times when such events are simply the result of unique weather systems. In this new effort, the researchers wondered if the [warmer temperatures](#) observed around the world are leading to more extreme rainfall events in North America—warmer air holds more water, after all. To find out if this might be the case, they obtained weather data from a variety of sources covering the years 1961 to 2010, focusing most specifically on maximum rainfall amounts for given areas over one- or five-day periods. They then carried out four kinds of calculations designed to describe the probability of such rainfall events occurring as temperatures in the area rose due to [global warming](#), from which they created models depicting extreme rainfall events.

The models all showed increasing chances of extreme rainfall events, most particularly those in which large amounts of rain fall over a 24-hour period. They suggest that their models show that as global warming progresses, more extreme rainfall events occur. They also suggest that as the planet continues to heat up, such events are likely to

grow more extreme.

**More information:** Megan C. Kirchmeier-Young et al. Human influence has intensified extreme precipitation in North America, *Proceedings of the National Academy of Sciences* (2020). [DOI: 10.1073/pnas.1921628117](https://doi.org/10.1073/pnas.1921628117)

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