

Have the Number of Extreme Weather Events Increased Over the Past Decade? (2010-2020)

As climate change becomes an increasingly urgent global concern, understanding its influence on extreme weather patterns is essential. This study investigates how the frequency of extreme weather events has shifted over time and identifies which specific types of events have become more or less common. To further evaluate the severity of these events, we also analyze associated economic impacts by examining recorded damage costs. We used data from NOAA (National Oceanic and Atmospheric Association) for the years 2010–2020.

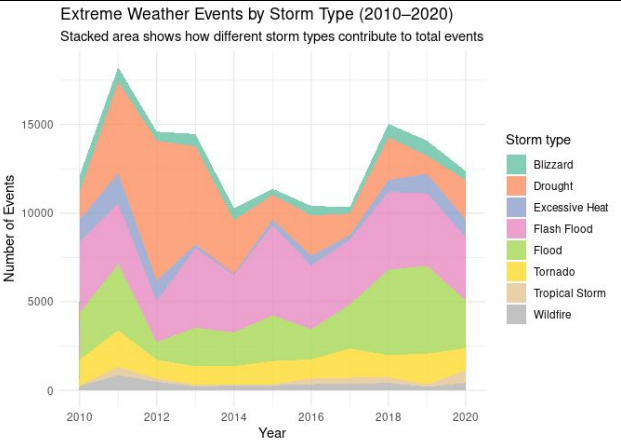


Figure 2

Figure 2 demonstrates the frequency of specific extreme weather events. We organized by color to highlight how each storm type contributes to the total number of events over time. The stacked area format shows not only year-to-year fluctuations within individual categories, such as the noticeable spikes in flash floods and droughts around 2011 and 2018, but also broader trends across the decade. For example, floods and flash floods consistently make up a large portion of total events, whereas blizzards and wildfires remain relatively low but steady.

Number of tornadoes per county
NOAA data from 2010-2020

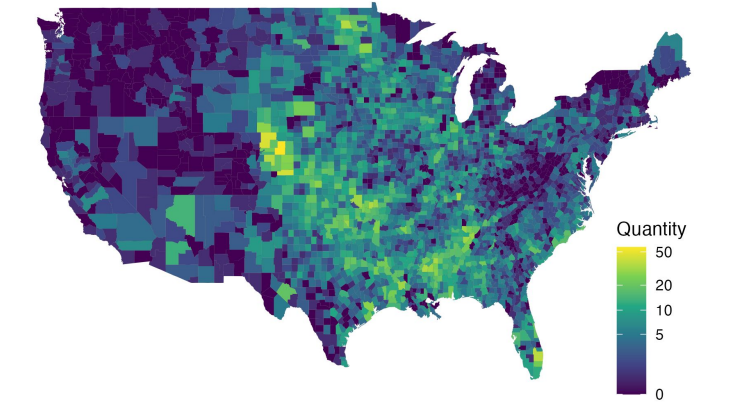


Figure 3

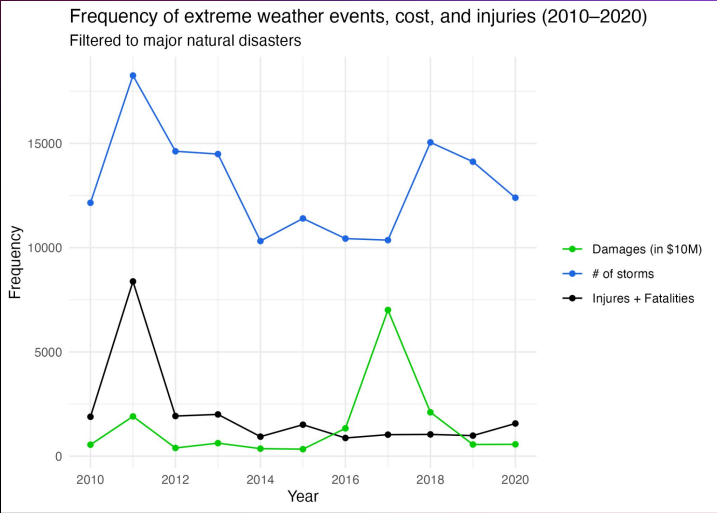
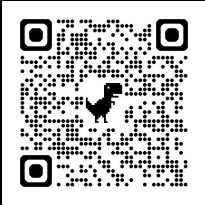


Figure 1

Figure 1 illustrates the frequency of extreme weather events alongside the total associated damage costs and the number of injuries or fatalities resulting from these incidents. While an increase in event frequency would typically be expected to correlate with higher casualty and damage figures, this relationship can weaken when a large proportion of events are relatively minor. The data show a clear correlation between extreme weather frequency and injuries/fatalities during the 2010–2014 period. However, although the frequency of events continues to rise during 2016–2020, neither damage costs nor injury/fatality counts increase at the same rate. This pattern suggests that the later events were either less severe or occurred in regions better equipped to mitigate their impacts.



QR code to our project website

Figure 3 demonstrates demonstrates the geographic distribution of tornado occurrences across the United States between 2010 and 2020. Each county is shaded according to the number of reported tornadoes, with darker colors indicating fewer events and brighter yellow tones representing higher concentrations. The map reveals a clear regional pattern: the central United States such as Oklahoma, Kansas, Nebraska, and parts of Texas show consistently elevated tornado activity. In contrast much of the West and Northeast experience comparatively few events.