Reproducible Research: Course Project 2

The most harmful and costly US Weather events

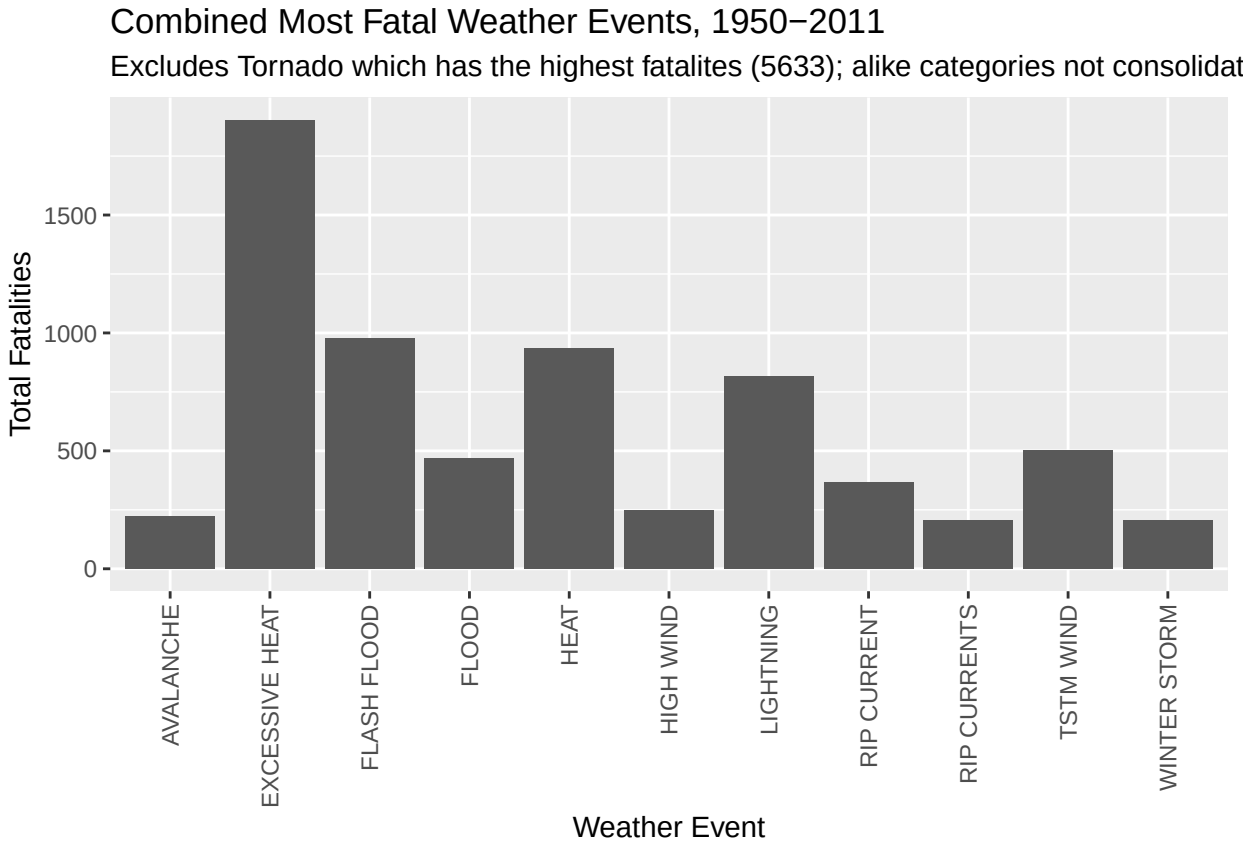
Th U.S. National Oceanic and Atmospheric Administration's (NOAA) storm database was used to examine which types of storms or major weather events resulted in the highest casualties or injuries, as well as the most expensive property damage, across the United States. Tornadoes were the greatest source of fatalities and injuries, and floods were the most costly in terms of property damage by a large margin. In the case of both fatalities and injuries tornadoes were removed from the graphs because the large numbers overwhelmed the details of other weather events, but the details for tornadoes are included numerically in the chart subheader. The data is from 1950 to November 2011, and it is important to note that only one weather event category can be selected, so similar event types were not combined.

Data Processing

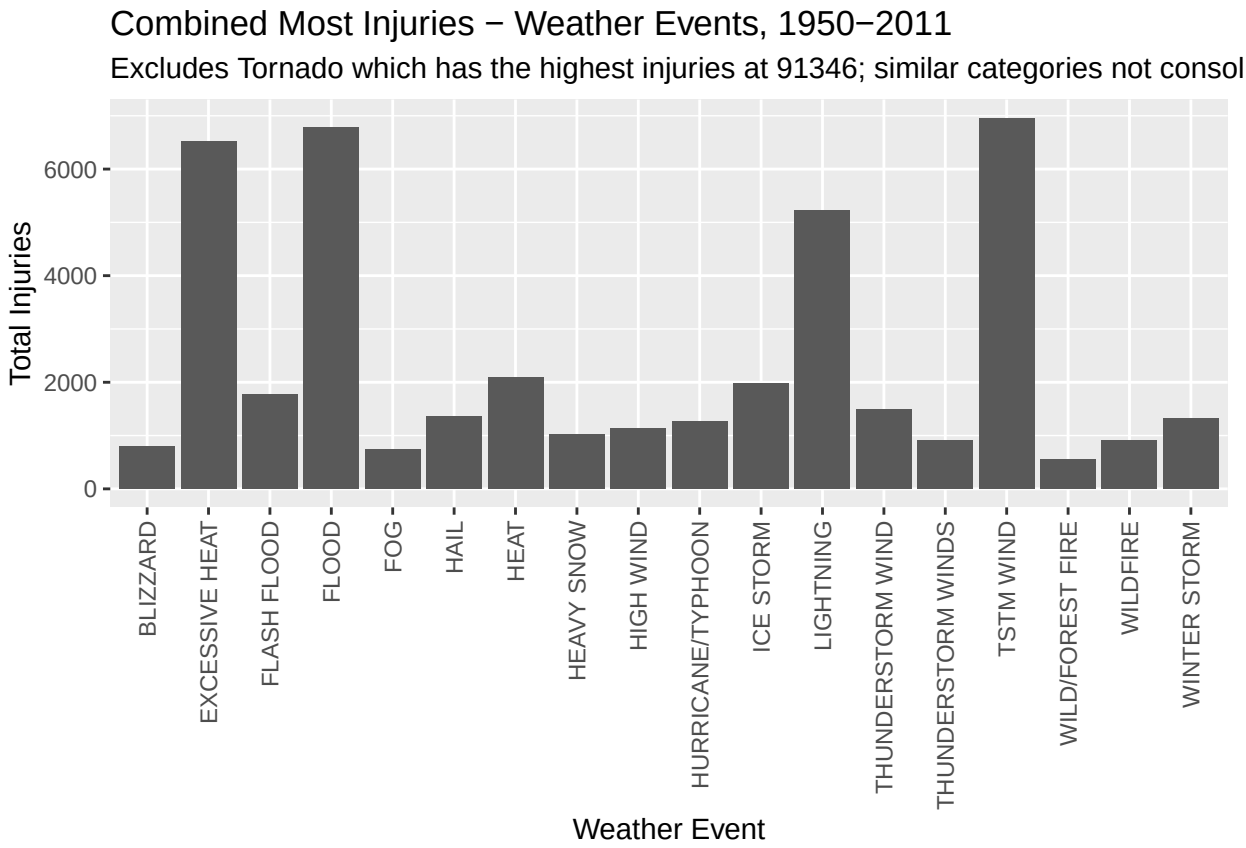
The data was read in as a csv file and formatted as a data frame. The 'aggregate' function was then used to sum across event type for a specific variable, like Fatalities, for the first chart. Once all the event fatalities were summed, a subset of the the largest values was creating by excluding the lower count values. For the first two charts, the largest value, tornadoes, was also excluded to be able to better see the details of the rest of the remaining event types. One the information was limited to the top ten to fifteen values, I made a bar chart using ggplot.

Results

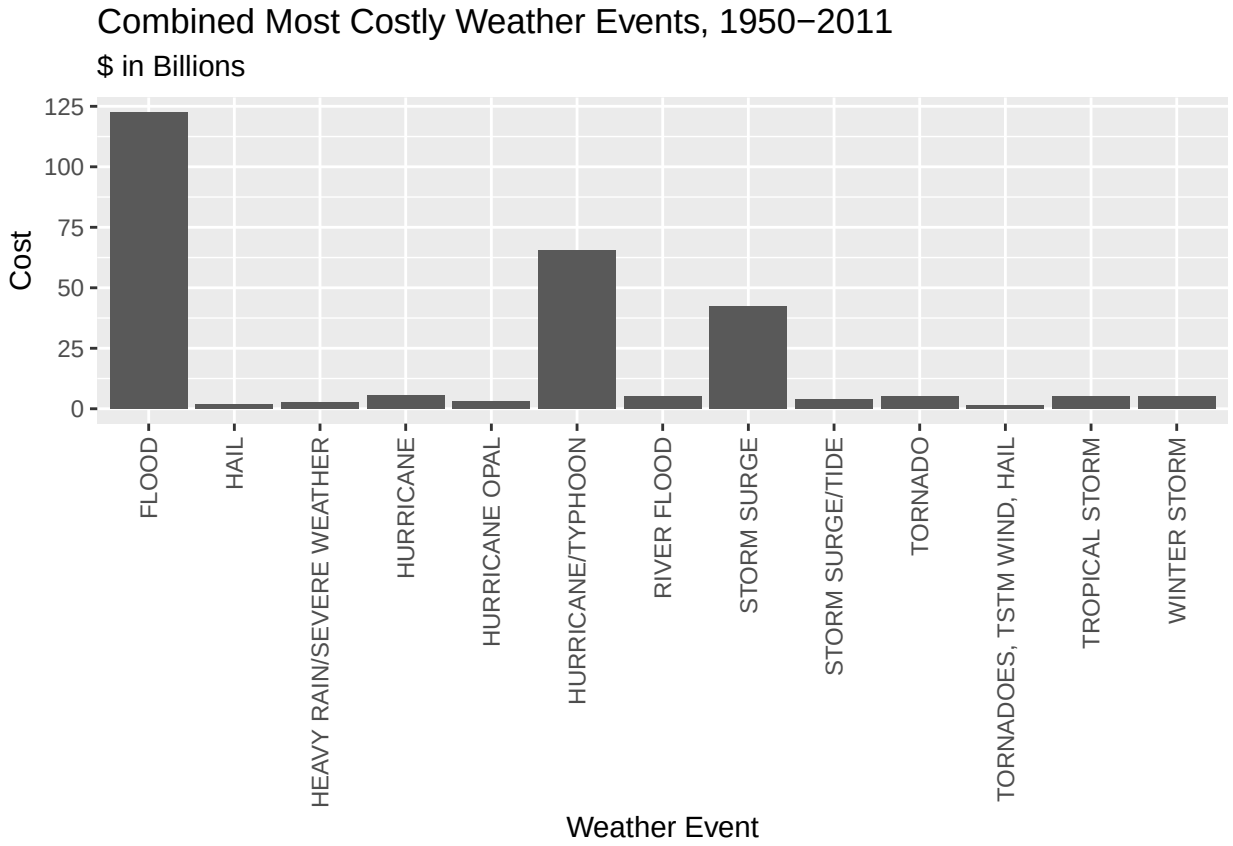
After tornadoes, the top weather event that is most harmful to population health is excessive heat which causes the second most fatalities at approximately 1900 deaths, followed by flash floods and flooding which combine to around 1500 deaths over the 61-year time period. 'Excessive Heat' differs from 'Heat' by requiring high humidity in addition to high temperatures.



When you examine harmful weather event types with respect to causing the most injuries, tornadoes again dominate the totals with over 91,000 injuries over the 61-year time frame. The next weather events that cause the most injury are: marine thunderstorm wind occurring over the waters and bays of the ocean (labeled TSTM WIND in chart) which caused just under 7000 injuries, this category differs from 'Thunderstorm Wind' in the chart, which are winds arising from lightning being observed or detected within 30 minutes. Flooding is the third highest weather event injury category with just under 6800 injuries over the time frame. Excessive Heat (6525) and Lightning (5230) rounding out the top 5 weather event injury categories, with actual counts listed in the parentheses.



Across the U.S. the types of weather events that have had the greatest economic consequences from 1950 to 2011 primarily include water related events. Floods had the highest cost of $122.5 billion, followed by Hurricanes or Typhoons at a cost of $65.5 billion, and Storm Surges which a total cost of just over $42.5 billion were the three most costly weather events totals over the 61-year time period. These three noted weather events categories were the clear expense leaders.



In conclusion, based on the data tornadoes were the most dangerous weather events for public health causing the greatest number of fatalities and injuries over the time period, while flooding posed the greatest economic consequences to the United States. —