Finding the most devastating type of severe weather events across the United States

Synopsis

Storms and other severe weather events can cause both public health and economic problems for communities and municipalities. Many severe events can result in fatalities, injuries, and property damage, and preventing such outcomes to the extent possible is a key concern. In this report we aim to find out, across the United States, which type of evere weather events are most harmful, in terms of population health and economic consequence respectively? To get the answer of the questions, we obtained major storms and weather events datas from NOAA storm database. The dataset contains characteristics of major storms and weather events in the United States between the yeas 1950 and 2011, including when and where they occur, as well as estimates of any fatalities, injuries, and property damage. From these data, we found that, on summation of damage between 1950 and 2011, “TORNADO” is the most harmful type of events both with respect to opulation health and economic consequence.

Data Processing

The data for this report come in the form of a comma-separated-value file, you can download the file from the course web site. After downloading the file, unzip it by hand and put it in workspace dir by giving it a file name “repdata_data_StormData.csv”. Then we read in the data from the first 500000 rows.

```
events <-
read.csv("repdata_data_StormData.csv",na.strings =
"",nrows=500000)
```

After reading we check the dimensions and the first few rows in this dataset.

```
dim(events)
## [1] 500000     37
head(events[, 1:15])
##   STATE__           BGN_DATE BGN_TIME TIME_ZONE
COUNTY COUNTYNAME STATE
## 1       1  4/18/1950 0:00:00     0130        CST
97     MOBILE    AL
## 2       1  4/18/1950 0:00:00     0145        CST
3    BALDWIN    AL
## 3       1  2/20/1951 0:00:00     1600        CST
57    FAYETTE    AL
## 4       1   6/8/1951 0:00:00     0900        CST
89    MADISON    AL
## 5       1 11/15/1951 0:00:00     1500        CST
43    CULLMAN    AL
## 6       1 11/15/1951 0:00:00     2000        CST
77 LAUDERDALE    AL
##    EVTYPE BGN_RANGE BGN_AZI BGN_LOCATI END_DATE
END_TIME COUNTY_END
## 1 TORNADO         0     <NA>        <NA>      <NA>
<NA>          0
```

```
## 2 TORNADO          0      <NA>      <NA>      <NA>
<NA>            0
## 3 TORNADO          0      <NA>      <NA>      <NA>
<NA>            0
## 4 TORNADO          0      <NA>      <NA>      <NA>
<NA>            0
## 5 TORNADO          0      <NA>      <NA>      <NA>
<NA>            0
## 6 TORNADO          0      <NA>      <NA>      <NA>
<NA>            0
##    COUNTYENDN
## 1          NA
## 2          NA
## 3          NA
## 4          NA
## 5          NA
## 6          NA
```

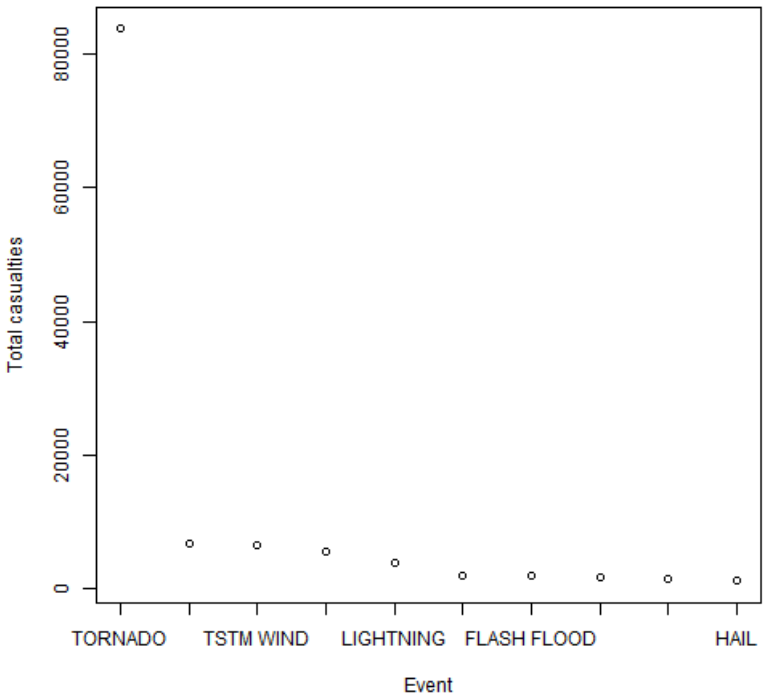
RESULT

First we sum up public health losses relevant to all type of events respectively. The losses include both fatalities and injueries. Then we find which type of events has the max value.

```
casualty<-
with(events,tapply(FATALITIES+INJURIES,EVTYPE,sum))
which.max(casualty)
## TORNADO
##     826
```

So “TORNADO” is the most harmful type of event.
We can find that from the plot downside. Order the casualty value decreasly and get top 10 events.

```
top_casualty<-
head(casualty[order(casualty,decreasing=TRUE)],10)
plot(top_casualty, xaxt = "n", xlab = "Event", ylab =
"Total casualties")
axis(1, 1:length(top_casualty), names(top_casualty))
```

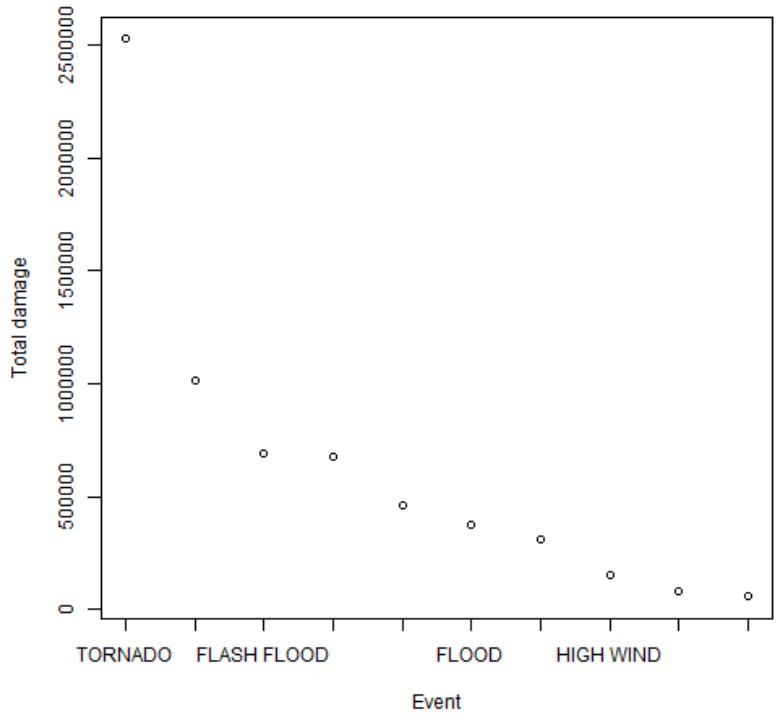


Next, we sum up economic losses caused by different type of events. The losses including both property and corps. Then we find which type of events has the max value.

```
damage<-with(events,tapply(PROPDMG+CROPDMG,EVTYPE,sum))
which.max(damage)
## TORNADO
##     826
```

So “TORNADO” is the most harmful type of event.
We can find that from the plot downside. Order the damage value decreasly and get top 10 events.

```
top_damage<-
head(damage[order(damage,decreasing=TRUE)],10)
plot(top_damage, xaxt = "n", xlab = "Event", ylab =
"Total damage")
axis(1, 1:length(top_damage), names(top_damage))
```


Total damage
0
500000
1000000
1500000
2000000
2500000
TORNADO
FLASH FLOOD
FLOOD
HIGH WIND
Event