Title: Measuring Impact of Natural Events

Snopysis

This analysis measures the impact of natural events. The two metrics used to measure the impact of the natural events are fatalities and economic damage.

Data Processing

```
require("data.table")
```

```
## Loading required package: data.table
```

```
setwd("C:/Users/Eric.Kim/Desktop/TSA Files/Coursera/Reproducible
Research/Assignment 2")

#read bz2 file
storm<-read.csv("repdata-data-StormData.csv.bz2")

#aggregate fatalities by event
storm<-data.table(storm)
setkey(storm, EVTYPE)
health<-data.frame(storm[,sum(FATALITIES), by=EVTYPE])
names(health)[1]<-"event"
names(health)[2]<-"fatalities"
health<-health[with(health, order(-fatalities)),]
health<-head(health,20)

#convert storm from data table to data frame
storm<-data.frame(storm)

#Transform the costs data by multipling by thousands or millions.  The reason
for the transformation
#is to add the crop and property damage as total costs
storm$CROPDMG2<-ifelse(storm$CROPDMGEXP=='K', storm$CROPDMG*1000,
       ifelse(storm$CROPDMGEXP=='M', storm$CROPDMG*1000000, storm$CROPDMG))
storm$PROPDMG2<-ifelse(storm$PROPDMGEXP=='K', storm$PROPDMG*1000,
       ifelse(storm$PROPDMGEXP=='M', storm$PROPDMG*1000000, storm$PROPDMG))

#sum damage costs
storm$damage<-rowSums(storm[,38:39])
storm<-data.table(storm)
setkey(storm, EVTYPE)
damage<-data.frame(storm[,sum(damage), by=EVTYPE])
names(damage)[1]<-"event"
names(damage)[2]<-"damage"
damage<-damage[with(damage, order(-damage)),]
damage<-head(damage,20)
```

Results

The most destructive natural events are tornados. They caused the most fatalities and economic damage is Tornado, resulting in 5,633 deaths and causing $52B in damages.

Events Most Harmful to Public Health

```
#display to 20 fatal events
health
```

```
##                       event fatalities
## 834                 TORNADO       5633
## 130          EXCESSIVE HEAT       1903
## 153             FLASH FLOOD        978
## 275                    HEAT        937
## 464               LIGHTNING        816
## 856               TSTM WIND        504
## 170                   FLOOD        470
## 585             RIP CURRENT        368
## 359               HIGH WIND        248
## 19                AVALANCHE        224
## 972            WINTER STORM        206
## 586            RIP CURRENTS        204
## 278               HEAT WAVE        172
## 140            EXTREME COLD        160
## 760       THUNDERSTORM WIND        133
## 310               HEAVY SNOW        127
## 141 EXTREME COLD/WIND CHILL        125
## 676             STRONG WIND        103
## 30                 BLIZZARD        101
## 350               HIGH SURF        101
```

```
#plot fatalities by event
library(ggplot2)
ggplot(health, aes(event,
fatalities))+geom_bar(stat="identity")+theme(axis.text.x = element_text(angle
= 90, hjust = 1))+ggtitle("Events Most Harmful to Public Health")
```

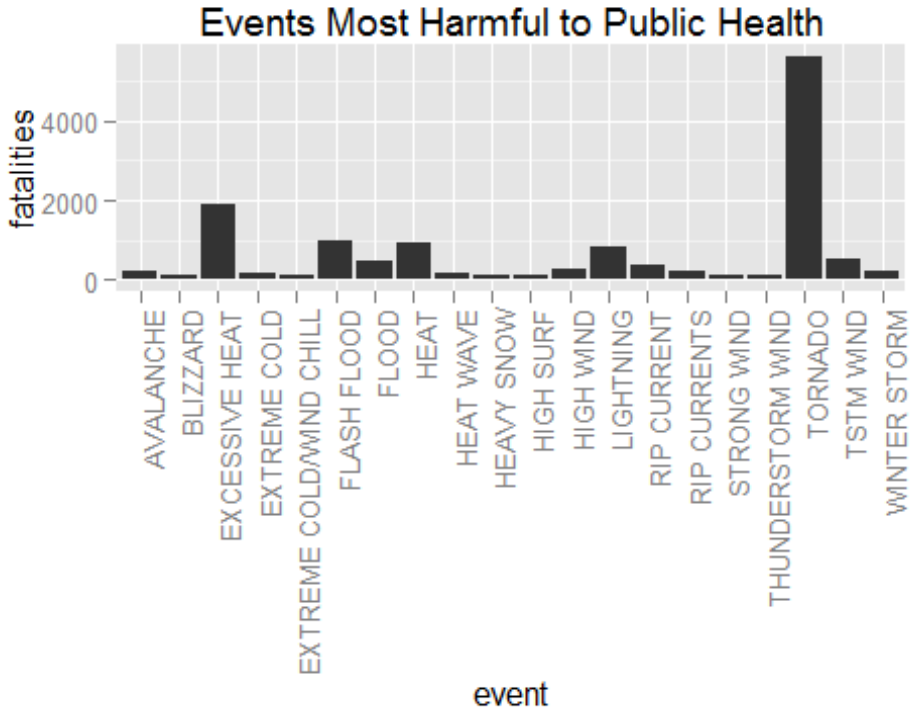

Figure Description: The figure above lists the top 20 events that have caused the most fatalities

Events with the Greatest Economic Damage

```
#display events that cause the most economic damaging
damage
```

```
##                   event    damage
## 834             TORNADO 5.204e+10
## 170               FLOOD 2.782e+10
## 244                HAIL 1.695e+10
## 153         FLASH FLOOD 1.656e+10
## 95              DROUGHT 1.352e+10
## 402           HURRICANE 8.910e+09
## 856           TSTM WIND 5.039e+09
## 411  HURRICANE/TYPHOON 4.904e+09
## 359           HIGH WIND 4.609e+09
## 957            WILDFIRE 4.021e+09
## 427           ICE STORM 3.967e+09
## 760  THUNDERSTORM WIND 3.898e+09
## 848      TROPICAL STORM 3.232e+09
## 786 THUNDERSTORM WINDS 1.924e+09
## 972        WINTER STORM 1.715e+09
## 955   WILD/FOREST FIRE 1.609e+09
## 290          HEAVY RAIN 1.428e+09
## 140        EXTREME COLD 1.361e+09
```

```
## 212       FROST/FREEZE 1.104e+09
## 310         HEAVY SNOW 1.067e+09

#graph economic damage
ggplot(damage, aes(event,
damage))+geom_bar(stat="identity")+theme(axis.text.x = element_text(angle =
90, hjust = 1))+ggtitle("Events that Cause the Most Economic Damage")
```

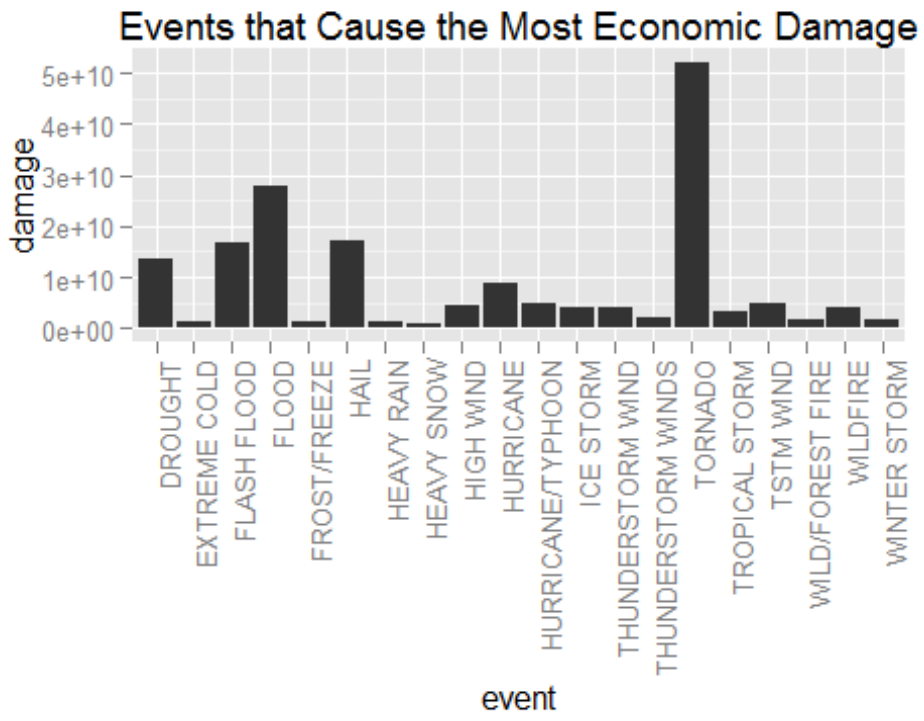

Figure Description: The figure above lists the top 20 events that have caused the most economic damage