# Storms in Florida

Presentation by:
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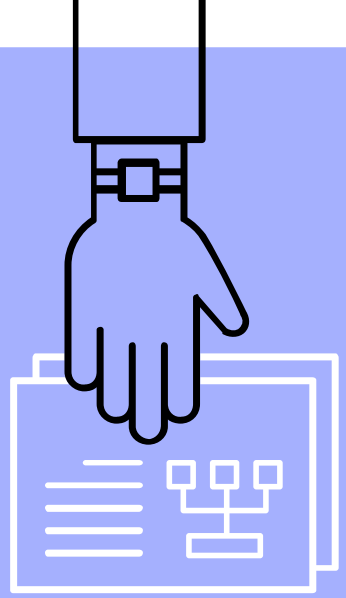
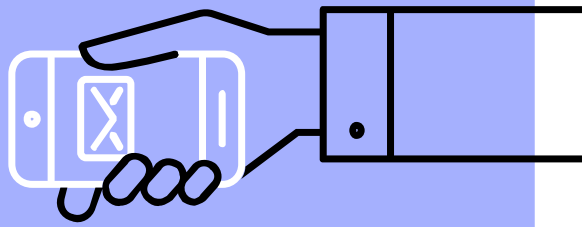
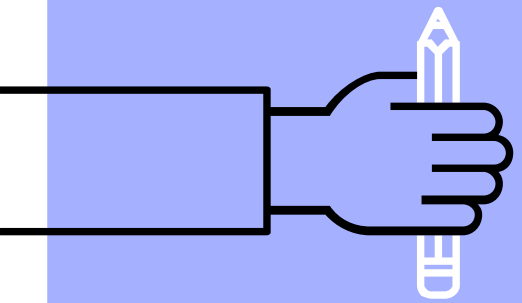
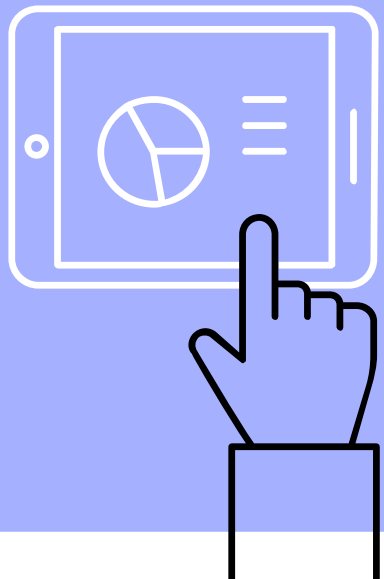


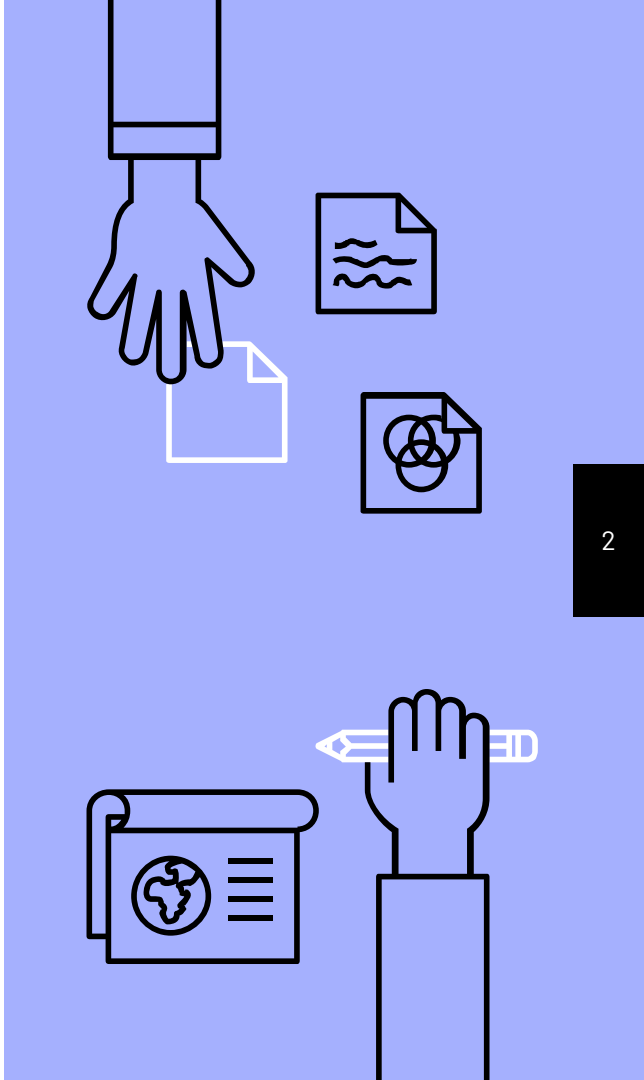






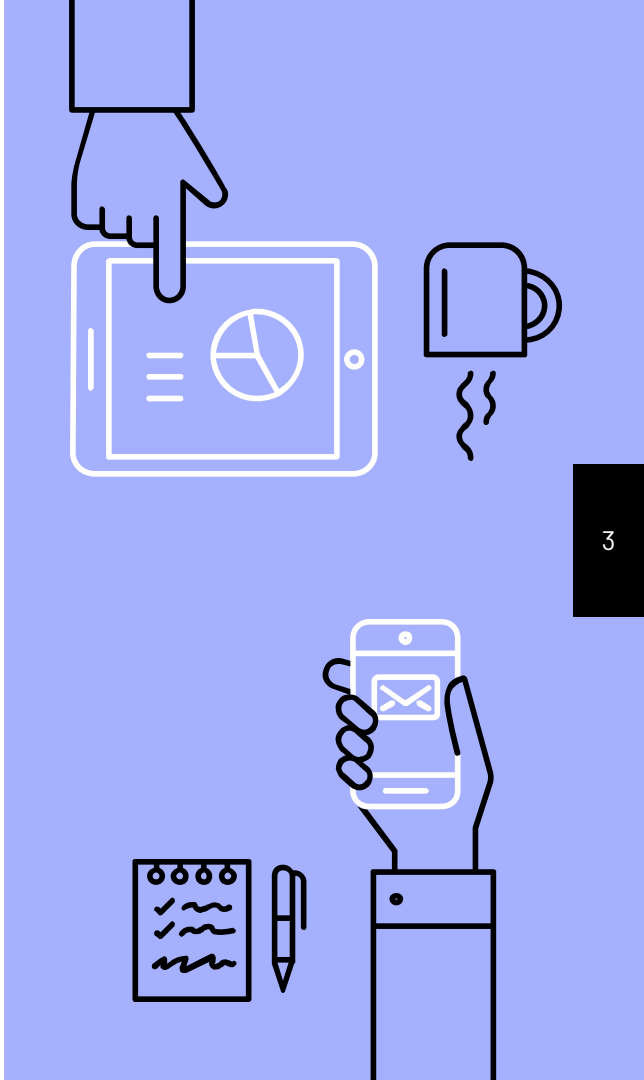
# Basic Information/Objective

In this project, we look into a variety of storm events that occur in the state of Florida, from thunderstorms to flooding. We then retrieved data from NOAA that determines how long each storm event occurs for, and how the aftermath of the storm affected officials and residents.



# Description of Dataset

The dataset describes the weather events that occurred in Florida 2013. It gives the 67 counties of Florida, the event types, the dates of the event types. In the dataset, it shows every storm event across all states, however, Florida is the main focus. The dataset also includes the month, day, and year of these storm events.



# Data Preparation

**Data Loading:**

The data was loaded as a CSV file

code:

```
df1 = pd.read_csv("stormdata_2013.csv")
df1
```

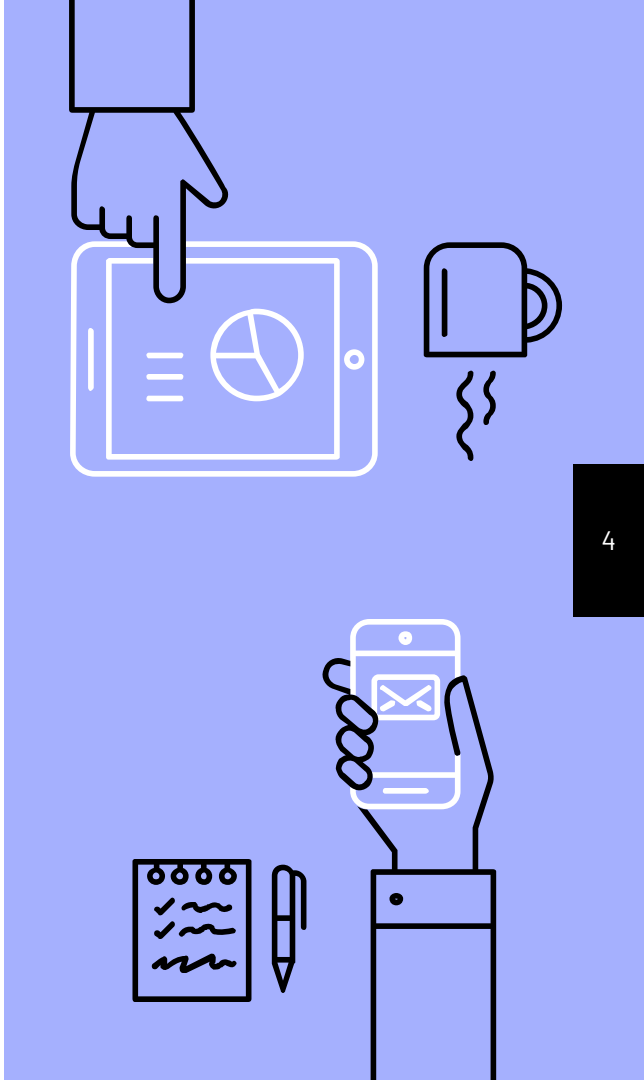
**Data Cleaning:**

We scaled the data down to Florida and took out data we did not understand or felt was unnecessary to keep. We wanted to focus on Florida out of all the states and we wanted to see the event type, the start and end of the event, the damages, and magnitude.

To select only Florida, we made a new dataframe and called it df2. We equaled df2 to our first dataframe, df1, and selected the column “STATE”. Afterwards we equaled it to “FLORIDA”, so the data would only be retrieved from the state of Florida. We lastly called df2, so it could print the result.

code:

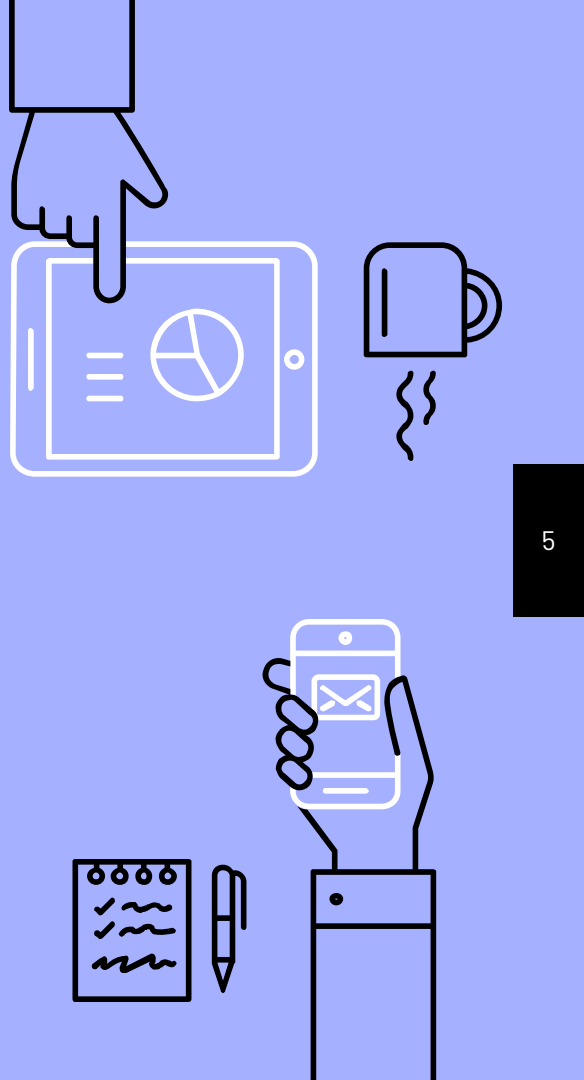
```
df2 = df1[ df1['STATE'] == 'FLORIDA']
df2
```



# Data Preparation (cont.)

In addition to prepping the dataset, we dropped many columns that were not relevant to what we were looking for and didn't have much information to use. These columns were dropped using the drop function.

In [4]:
```
florida2 = florida.drop(['EVENT_ID', 'STATE_FIPS', 'EPISODE_NARRATIVE', 'EVENT_NARRATIVE', 'LAST_MOD_DATE', 'LAST_MOD_TIME',
                         'LAST_CERT_DATE', 'LAST_CERT_TIME', 'ADDCORR_FLG', 'ADDCORR_DATE', 'BEGIN_LOCATION', 'YEAR',
                         'CZ_FIPS', 'BEGIN_AZIMUTH', 'END_RANGE', 'END_AZIMUTH', 'BEGIN_RANGE', 'END_LOCATION',
                         'BEGIN_LAT', 'BEGIN_LON', 'END_LAT', 'END_LON', 'CATEGORY', 'FLOOD_CAUSE', 'MAGNITUDE_TYPE',
                         'TOR_F_SCALE', 'TOR_LENGTH', 'TOR_WIDTH', 'TOR_OTHER_WFO', 'SOURCE', 'TOR_OTHER_CZ_STATE',
                         'TOR_OTHER_CZ_FIPS', 'TOR_OTHER_CZ_NAME', 'INJURIES_DIRECT', 'INJURIES_INDIRECT', 'DEATHS_DIRECT',
                         'DEATHS_INDIRECT', 'DAMAGE_CROPS', 'WFO', 'CZ_TIMEZONE', 'STATE', 'EPISODE_ID'], axis='columns')
florida2
```



# Data Preparation Images/Code

```
In [22]: import pandas as pd
         import numpy as np
         import csv
         import matplotlib.pyplot as plt
         import seaborn as sns
         from datetime import datetime
```

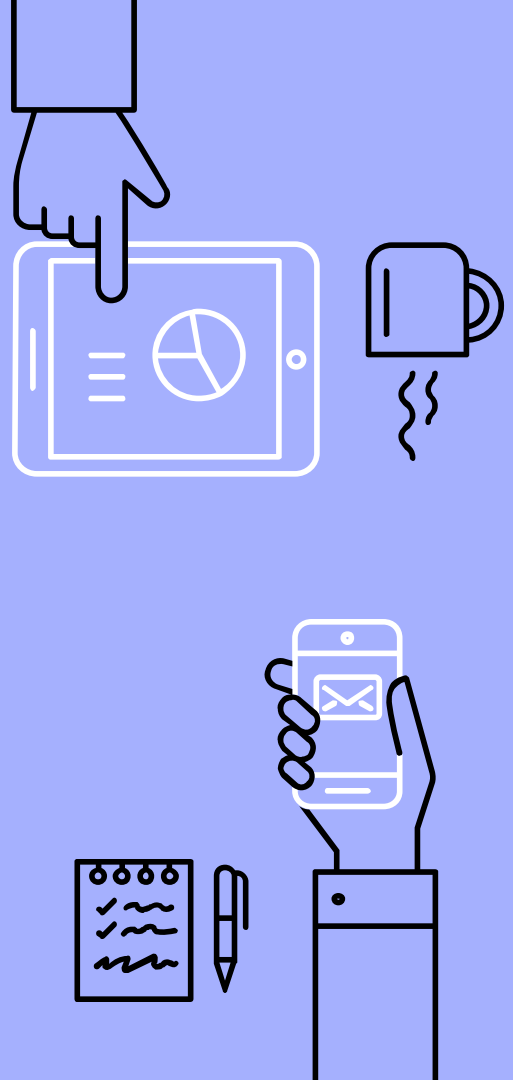
```
In [23]: df = pd.read_csv('stormdata_2013.csv')
         df
```

Out[23]:

| | BEGIN_YEARMONTH | BEGIN_DAY | BEGIN_TIME | END_YEARMONTH | END_DAY | END_TIME | EPISODE_ID | EVENT_ID | STATE | STATE_FIPS | ... |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 201301 | 1 | 0 | 201301 | 31 | 2359 | 70300 | 422180 | ALABAMA | 1 | ... |
| 1 | 201301 | 1 | 0 | 201301 | 31 | 2359 | 70580 | 423795 | COLORADO | 8 | ... |
| 2 | 201301 | 1 | 1230 | 201301 | 1 | 1230 | 71728 | 431896 | CALIFORNIA | 6 | ... |
| 3 | 201301 | 1 | 1800 | 201301 | 2 | 1400 | 70755 | 424932 | WYOMING | 56 | ... |
| 4 | 201301 | 1 | 1800 | 201301 | 2 | 1400 | 70753 | 424935 | SOUTH DAKOTA | 46 | ... |

```
In [4]: df2 = df1[df1['STATE'] == 'FLORIDA']
        df2
```

| _YEARMONTH | BEGIN_DAY | BEGIN_TIME | END_YEARMONTH | END_DAY | END_TIME | EPISODE_ID | EVENT_ID | STATE | MONTH_NAME | EVENT_TYPE | CZ_NAME | BEGIN_DAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201301 | 4 | 1330 | 201301 | 4 | 1342 | 69951 | 419577 | FLORIDA | January | Funnel Cloud | MIAMI-DADE | 1/4/20 |
| 201301 | 4 | 1540 | 201301 | 4 | 1545 | 69951 | 419578 | FLORIDA | January | Funnel Cloud | MIAMI-DADE | 1/4/20 |
| 201301 | 29 | 0 | 201301 | 31 | 2359 | 70302 | 422188 | FLORIDA | January | Drought | MADISON | 1/29/2 |
| 201301 | 29 | 0 | 201301 | 31 | 2359 | 70302 | 422187 | FLORIDA | January | Drought | INLAND JEFFERSON | 1/29/2 |
| 201301 | 29 | 0 | 201301 | 31 | 2359 | 70302 | 422186 | FLORIDA | January | Drought | LEON | 1/29/2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| 201310 | 15 | 1754 | 201310 | 15 | 1754 | 79203 | 475171 | FLORIDA | October | Coastal Flood | Duval | 10/15/20 |
| 201310 | 15 | 600 | 201310 | 15 | 600 | 79203 | 475170 | FLORIDA | October | Coastal Flood | Duval | 10/15/2 |
| 201310 | 15 | 536 | 201310 | 15 | 536 | 79203 | 475169 | FLORIDA | October | Coastal Flood | Duval | 10/15/2 |

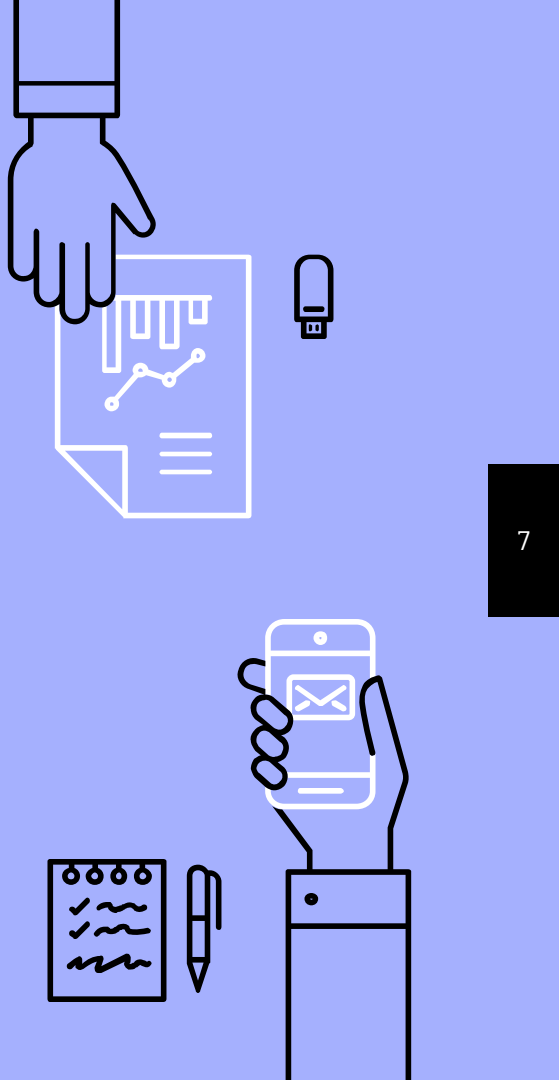


# Data Preparation Images/Code (cont)

Out[4]:

| | BEGIN_YEARMONTH | BEGIN_DAY | BEGIN_TIME | END_YEARMONTH | END_DAY | END_TIME | MONTH_NAME | EVENT_TYPE | CZ_TYPE | CZ_NAME | B |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **798** | 201301 | 4 | 1330 | 201301 | 4 | 1342 | January | Funnel Cloud | C | MIAMI-DADE | |
| **799** | 201301 | 4 | 1540 | 201301 | 4 | 1545 | January | Funnel Cloud | C | MIAMI-DADE | |
| **4039** | 201301 | 29 | 0 | 201301 | 31 | 2359 | January | Drought | Z | MADISON | |
| **4040** | 201301 | 29 | 0 | 201301 | 31 | 2359 | January | Drought | Z | INLAND JEFFERSON | |
| **4041** | 201301 | 29 | 0 | 201301 | 31 | 2359 | January | Drought | Z | LEON | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| **51161** | 201310 | 15 | 1754 | 201310 | 15 | 1754 | October | Coastal Flood | Z | Duval | |
| **51162** | 201310 | 15 | 600 | 201310 | 15 | 600 | October | Coastal Flood | Z | Duval | |
| **51163** | 201310 | 15 | 536 | 201310 | 15 | 536 | October | Coastal Flood | Z | Duval | |
| **51189** | 201310 | 17 | 1648 | 201310 | 17 | 1648 | October | Funnel Cloud | C | COLLIER | |
| **51231** | 201310 | 19 | 1611 | 201310 | 19 | 1631 | October | Heavy Rain | C | ST. JOHNS | |

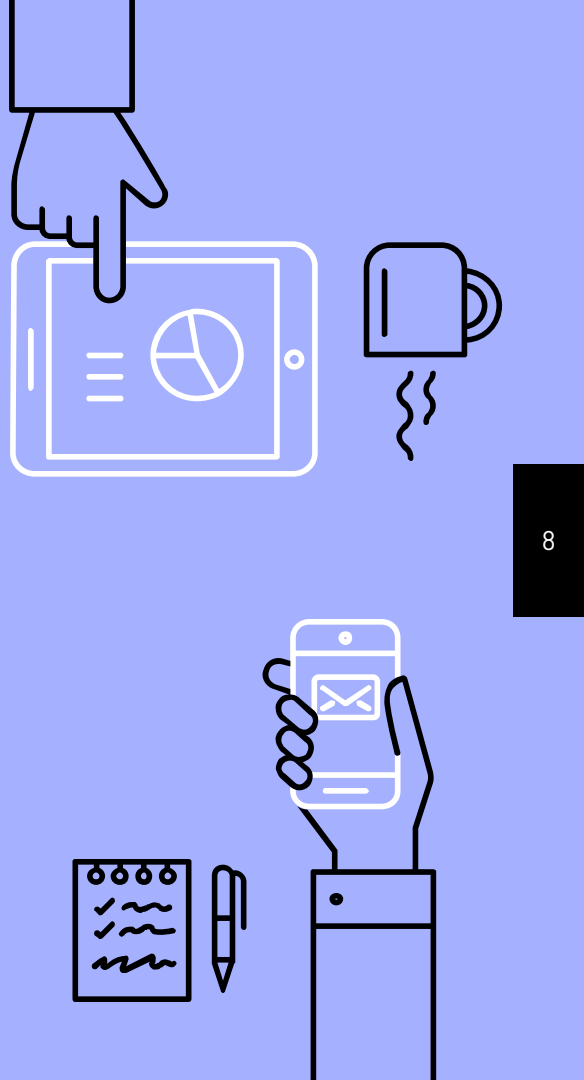
842 rows × 16 columns



# Data Analysis using Descriptive Statistics Images/Code

```
In [66]: df['MAGNITUDE'].mean()
         df['MAGNITUDE'].describe()
```

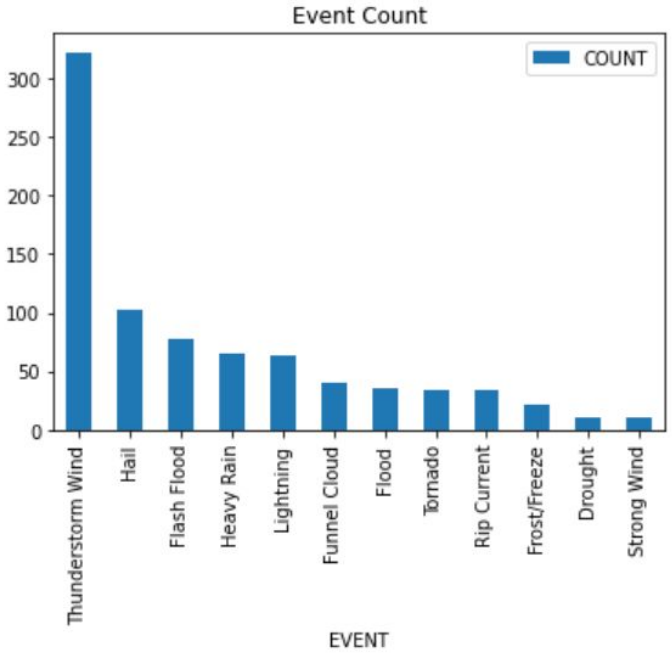
```
Out[66]: count    51932.000000
         mean        17.144878
         std         24.671429
         min          0.000000
         25%          0.000000
         50%          0.750000
         75%         50.000000
         max        105.000000
         Name: MAGNITUDE, dtype: float64
```



# Data Visualization

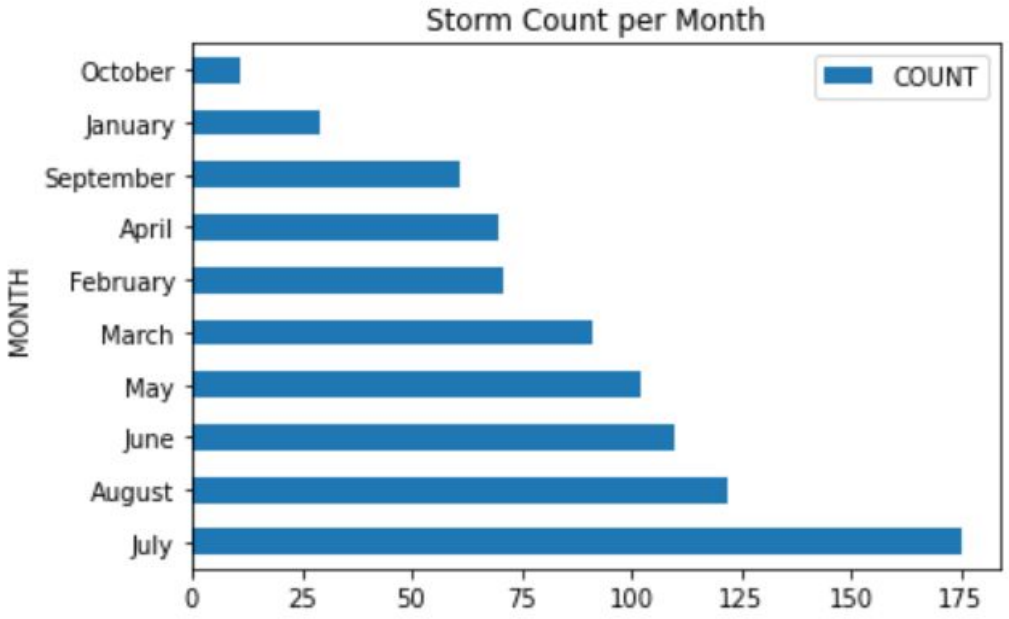
In [78]:
```
florida6 = florida5.sort_values(by='COUNT', ascending=False)
florida6 = florida6[:10]
florida6.plot.barh(title="Storm Count per Month",rot=0)
```

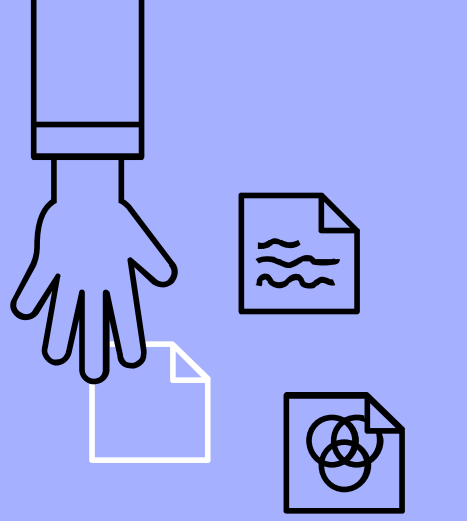
Out[78]: <AxesSubplot:title={'center':'Storm Count per Month'}, ylabel='MONTH'>

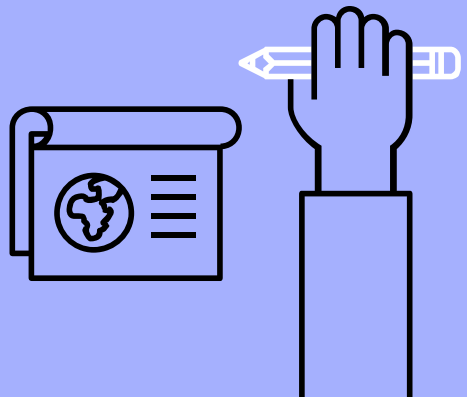


```
In [77]: florida8 = florida7.sort_values(by='COUNT', ascending=False)
         florida8 = florida8[:12]
         florida8.plot.bar(title="Event Count",rot=90)
```

```
Out[77]: <AxesSubplot:title={'center':'Event Count'}, xlabel='EVENT'>
```

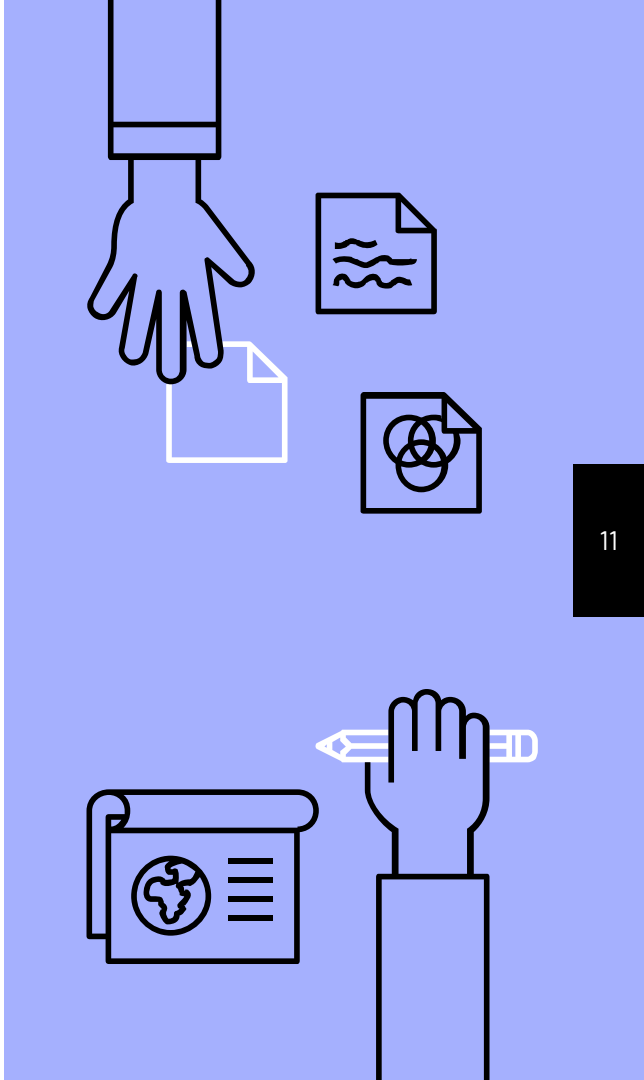




# Conclusion

Based on the graphs, we can conclude that most of the storm events occurred in the month of July and the most common event that occurred was thunderstorm winds, with hail being a close second that occurred in 2013. In the beginning of 2013, the longest duration of a drought was for 25 days. The property damage after a lightning storm was the most costly, being $95,000. Magnitude was used to measure wind speeds and hail size and in 2013, the average magnitude was 17.144878 and the maximum was 105. Overall, these kinds of events are seen more frequently due to climate change and it will only increase in the future.



# Source

https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Wildfire&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=2021&endDate_mm=01&endDate_dd=01&endDate_yyyy=2022&county=ALL&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=6%2CCALIFORNIA