

Final_Project_Report

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Description: The final Project involves analyzing storms data from NCDC (National Climatic Data Center)'s International Best Track Archive for Climate Stewardship (IBTrACS). We mainly works with data from East Pacific and North Atlantic basins.

Data Source:

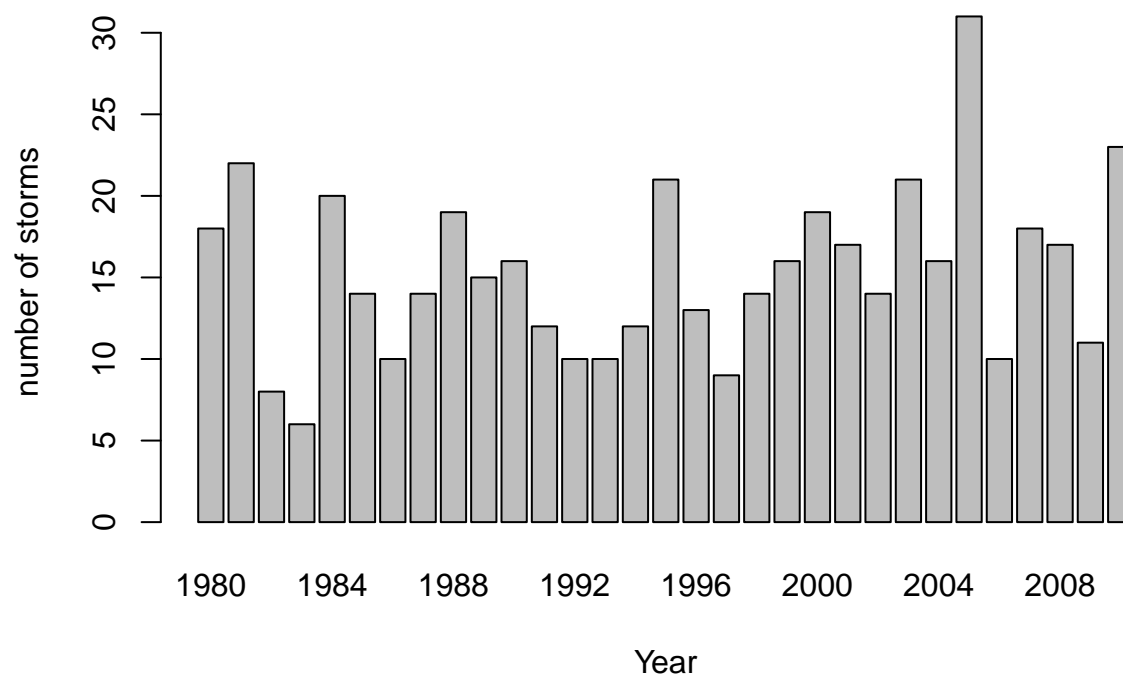
The link below consists data of storms from East Pacific: ftp://eclipse.ncdc.noaa.gov/pub/ibtracs/v03r06/wmo/csv/basin/Basin.EP.ibtracs_wmo.v03r06.csv The link below consists data of storms from North Pacific: ftp://eclipse.ncdc.noaa.gov/pub/ibtracs/v03r06/wmo/csv/basin/Basin.NA.ibtracs_hurdat.v03r06.hdat ftp://eclipse.ncdc.noaa.gov/pub/ibtracs/v03r06/wmo/csv/basin/Basin.NA.ibtracs_wmo.v03r06.csv

For data processing section, we produced two csv files that processed the raw data file for the North Atlantic basin in HURDAT format. The storms.csv based on the data from the HEADER of each storm. It includes id (stroms number since 1851), date, days (number of days in which positions are available), and name. The tracks.csv based on the HEADER and DAILY DATA from each storm. It includes id, date, period (00h, 06h, 12h, 18h), stage (type of stage), lat (latitude), long (longitude), wind (wind speed), and press (pressure).

For Data Analysis section, we focused on analyzing data of the North Atlantic Basin from 1980 to 2010. We used the previous cleaned-processed files storms.csv and tracks.csv as sources.

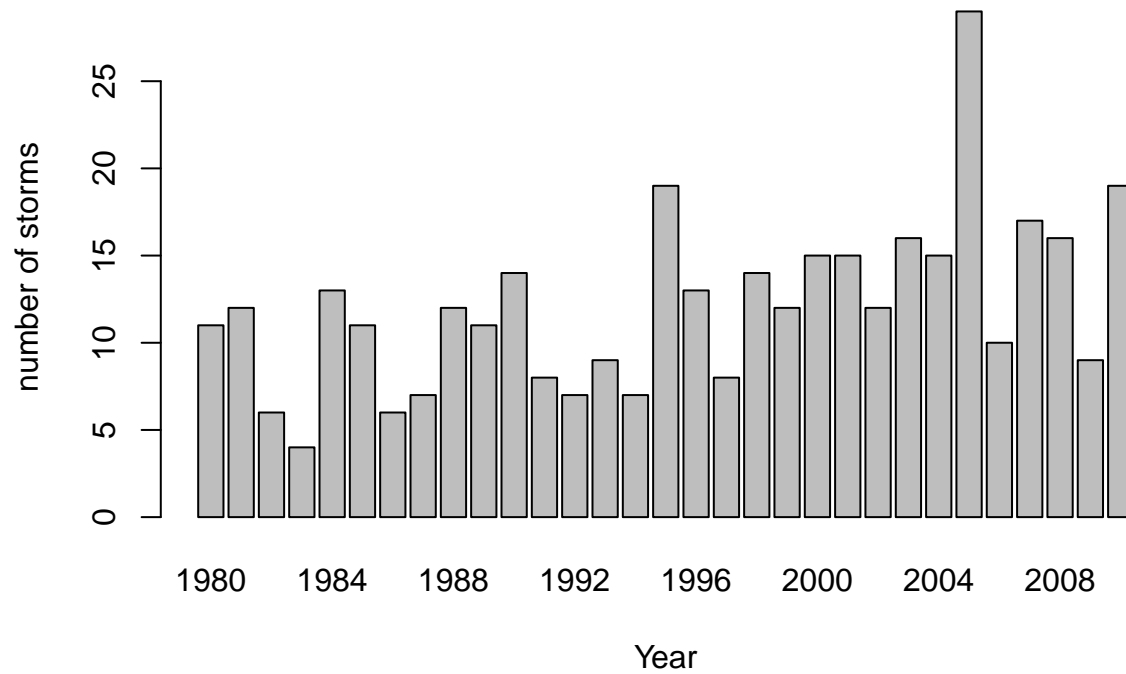
```
## year
## 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994
## 18 22 8 6 20 14 10 14 19 15 16 12 10 10 12
## 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
## 21 13 9 14 16 19 17 14 21 16 31 10 18 17 11
## 2010
## 23
```

number of storms per year



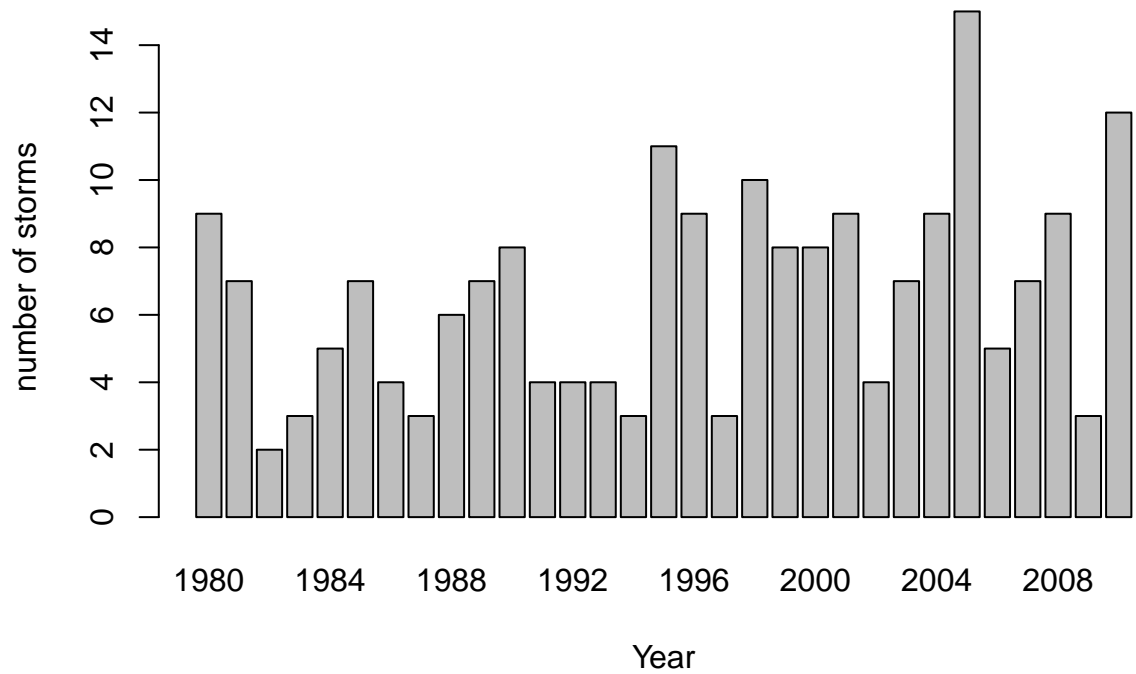
```
## year35
## 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994
##   11   12    6    4   13   11    6    7   12   11   14    8    7    9    7
## 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
##   19   13    8   14   12   15   15   12   16   15   29   10   17   16    9
## 2010
##   19
```

number of storms per year with wind ≥ 35



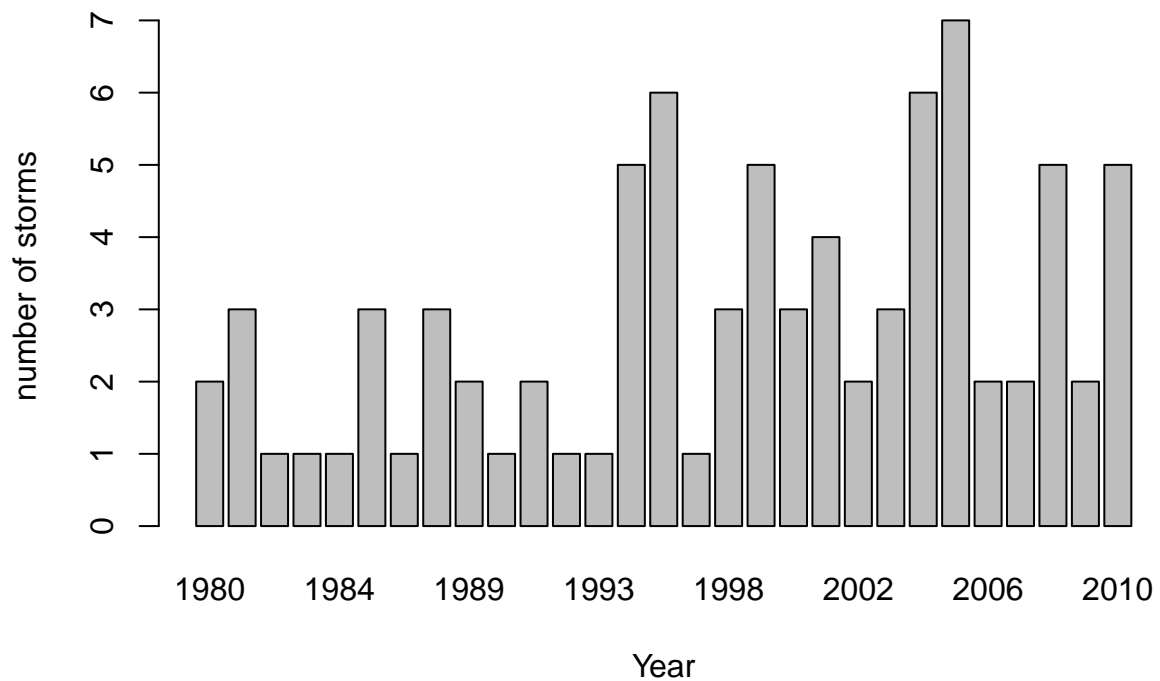
```
## year64
## 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994
##    9    7    2    3    5    7    4    3    6    7    8    4    4    4    3
## 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
##   11    9    3   10    8    8    9    4    7    9   15    5    7    9    3
## 2010
##   12
```

number of storms per year with wind ≥ 64



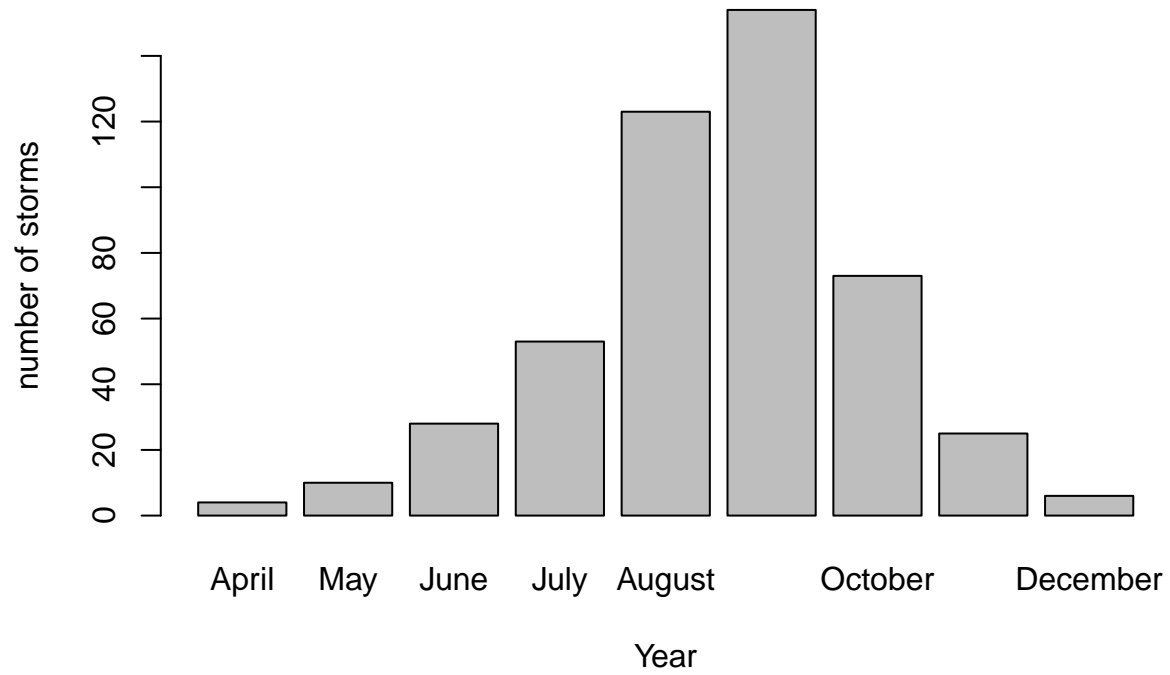
```
## year96
## 1980 1981 1982 1983 1984 1985 1987 1988 1989 1990 1991 1992 1993 1995 1996
##    2    3    1    1    1    3    1    3    2    1    2    1    1    5    6
## 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010
##    1    3    5    3    4    2    3    6    7    2    2    5    2    5
```

number of storms per year with wind ≥ 96



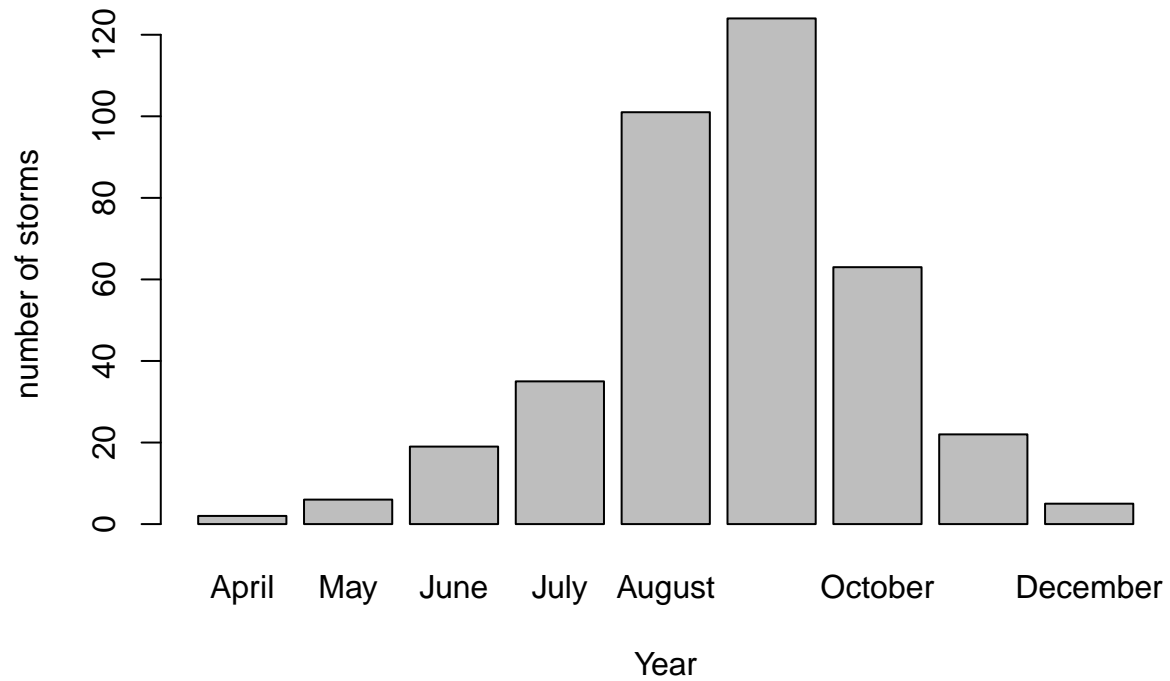
```
## month
## 04 05 06 07 08 09 10 11 12
## 4 10 28 53 123 154 73 25 6
```

number of storms per month



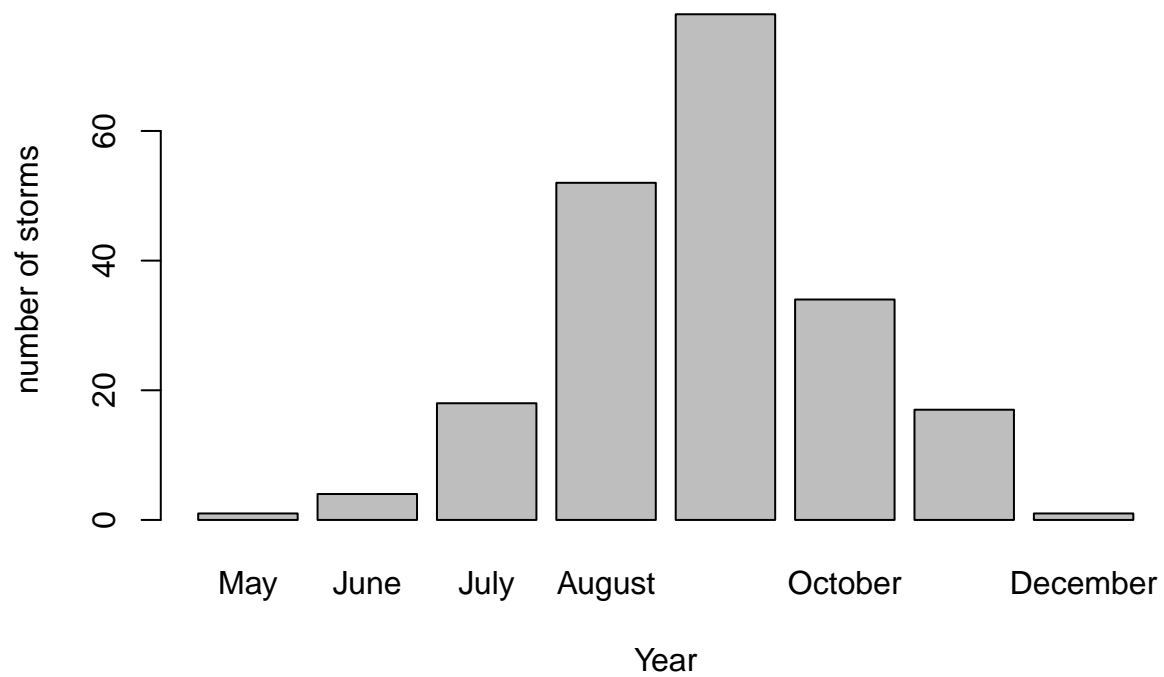
```
## month35
## 04 05 06 07 08 09 10 11 12
## 2 6 19 35 101 124 63 22 5
```

number of storms per month with wind ≥ 35



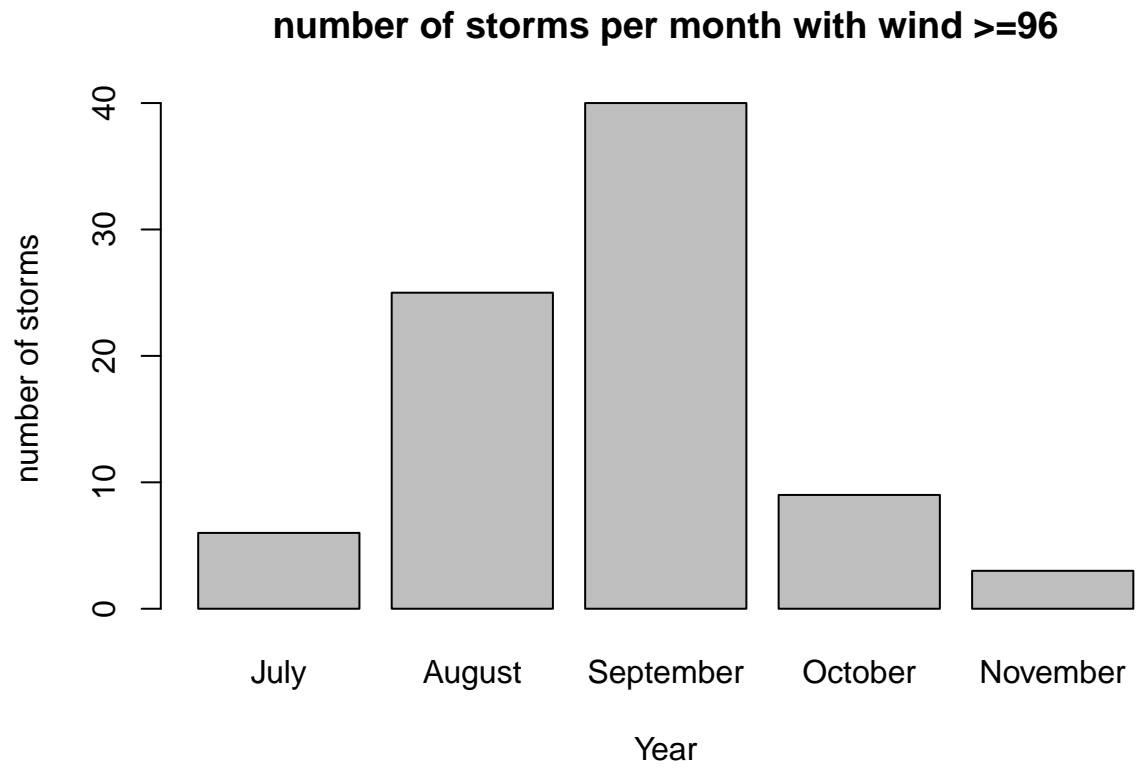
```
## month64
## 05 06 07 08 09 10 11 12
## 1 4 18 52 78 34 17 1
```

number of storms per month with wind ≥ 64

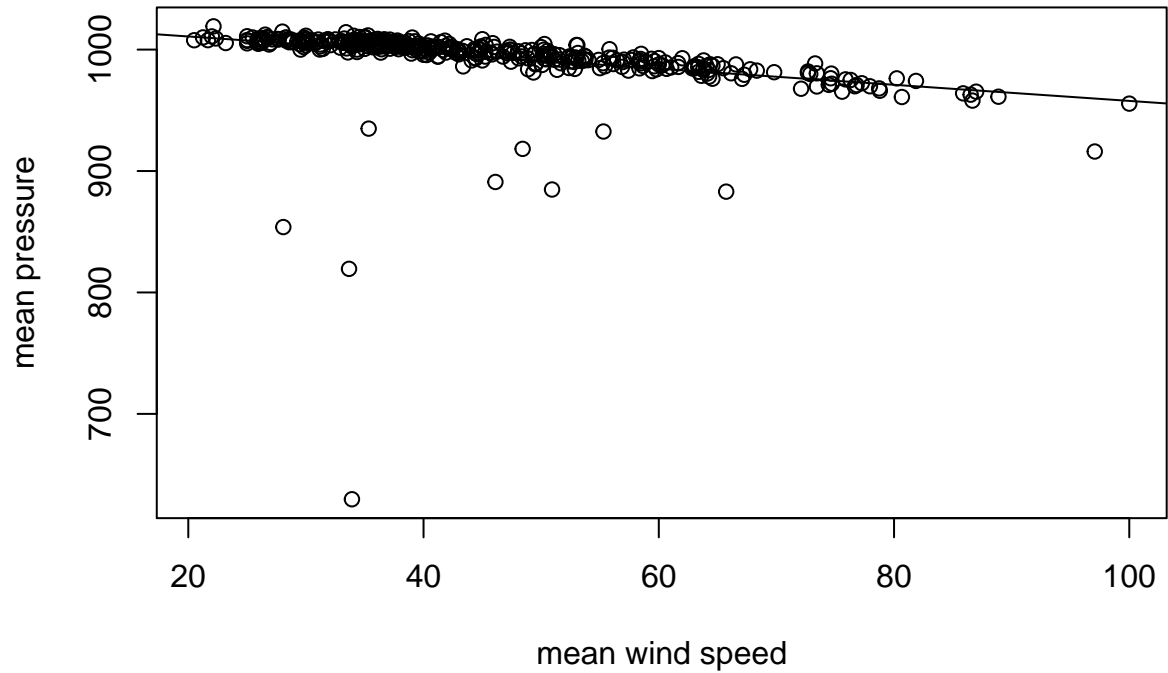


```
## month96
```

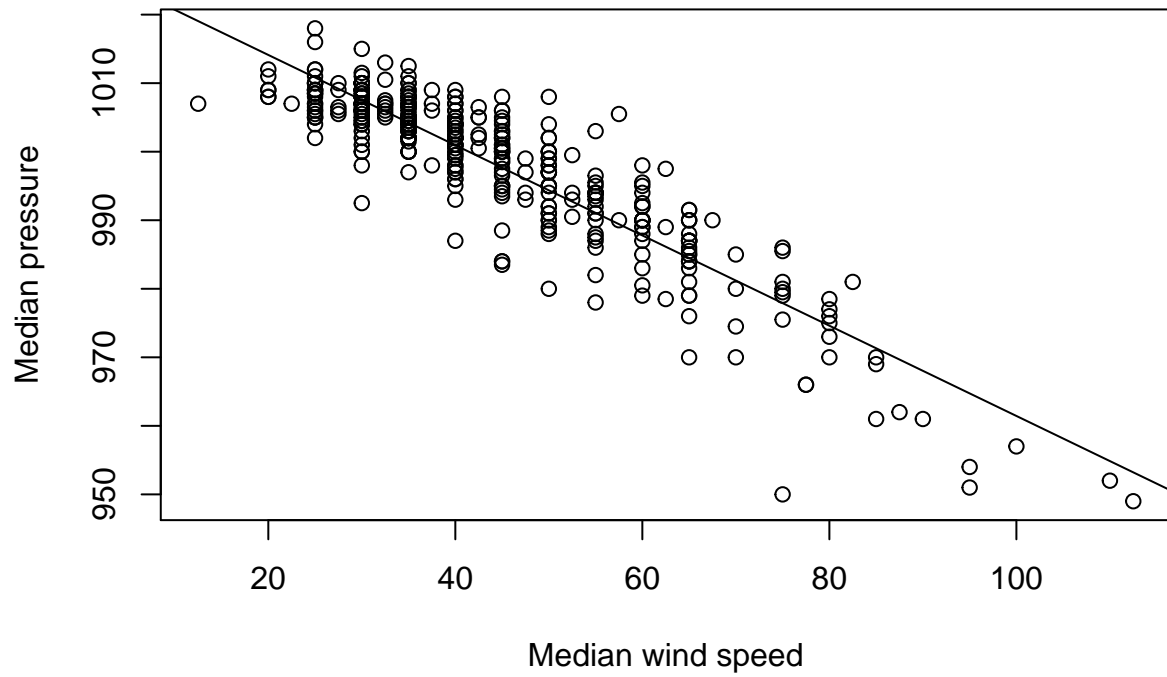
07 08 09 10 11
6 25 40 9 3



Mean Wind VS Mean Wind Speed for Each Storm

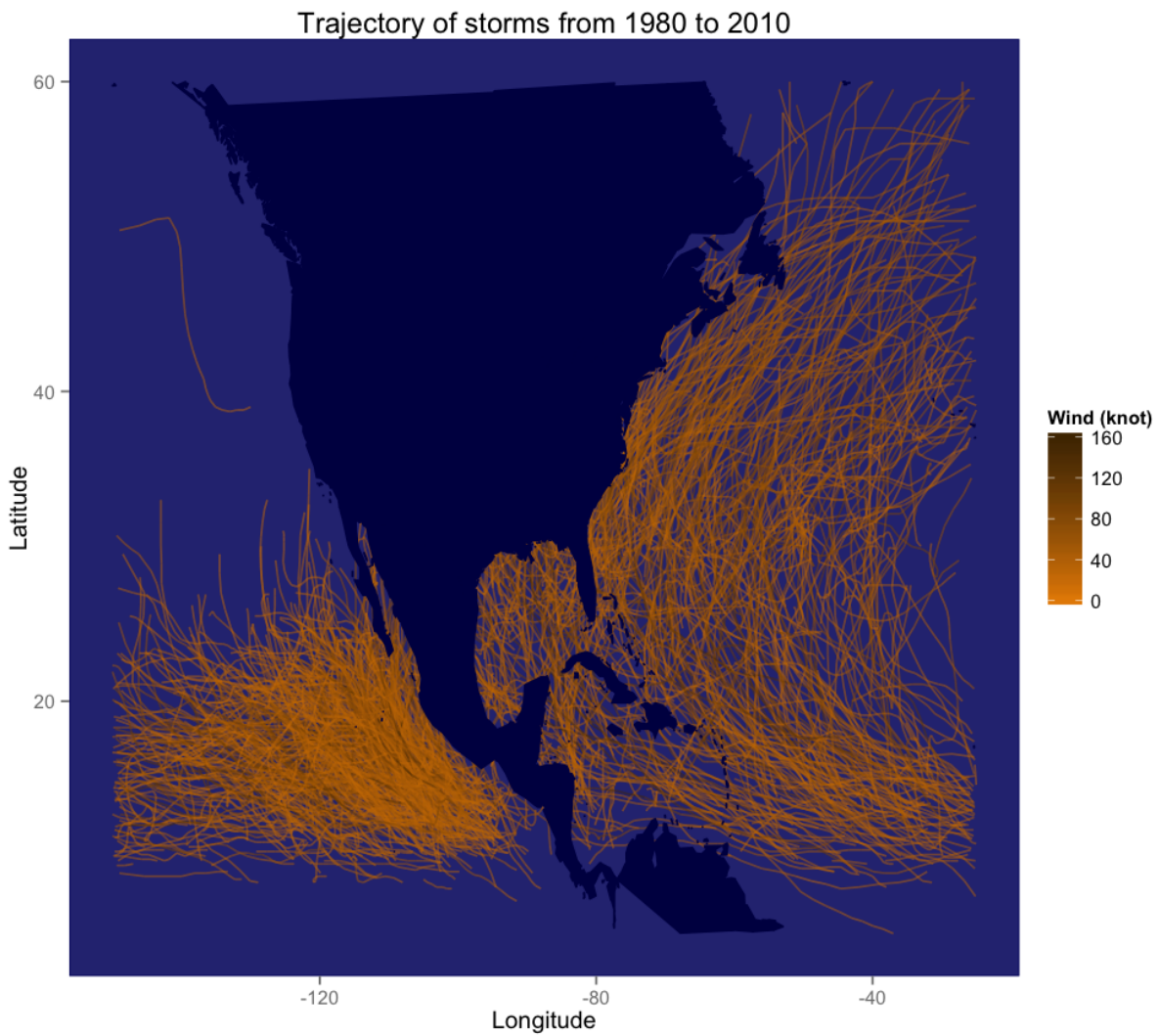


Median Wind Speed VS Median Pressure For Each Storm

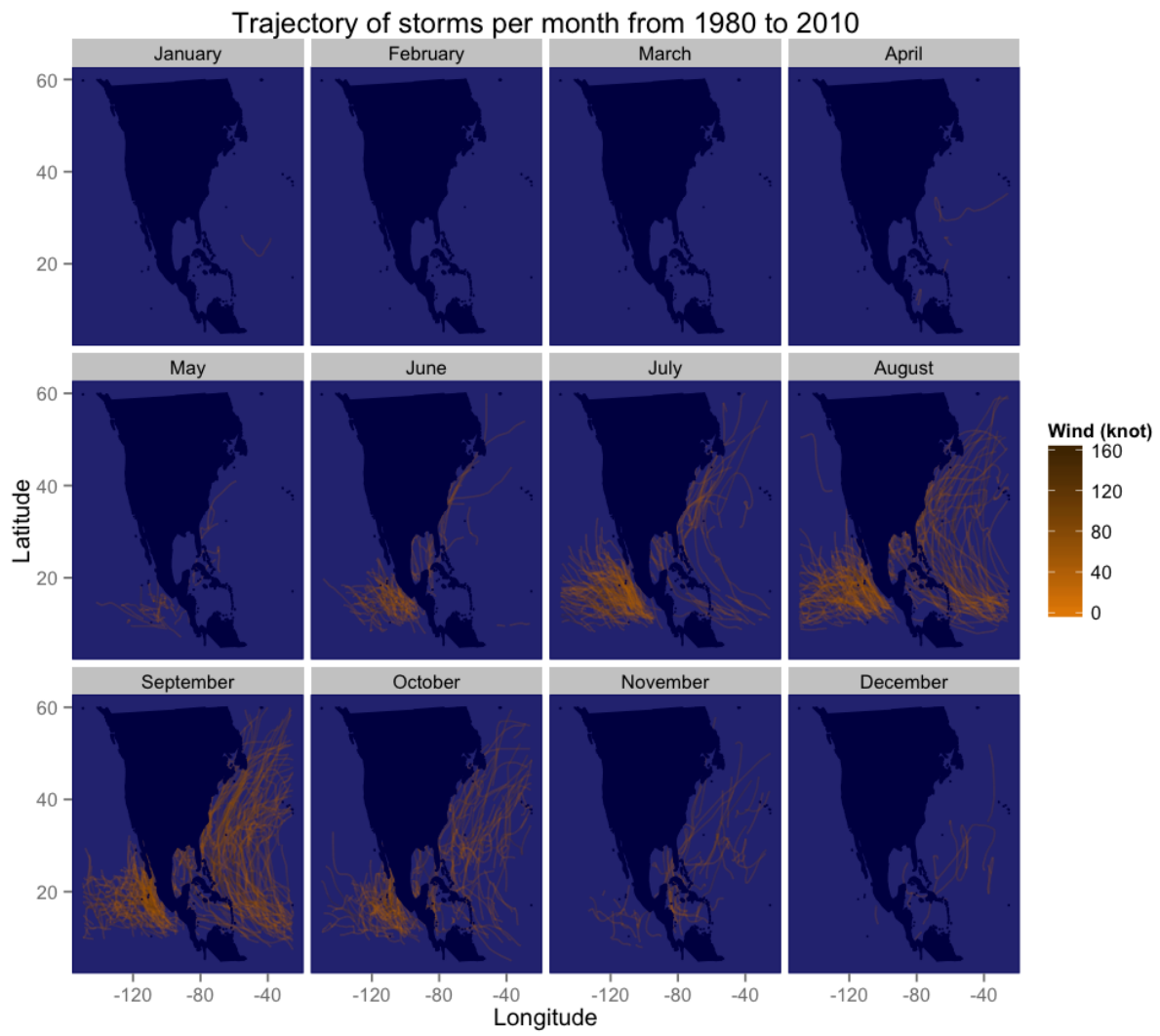


For the visualization part of the project involves using data to visualize the trajectory of the storms in both the East Pacific and the North atlantic basins from 1980 to 2010.

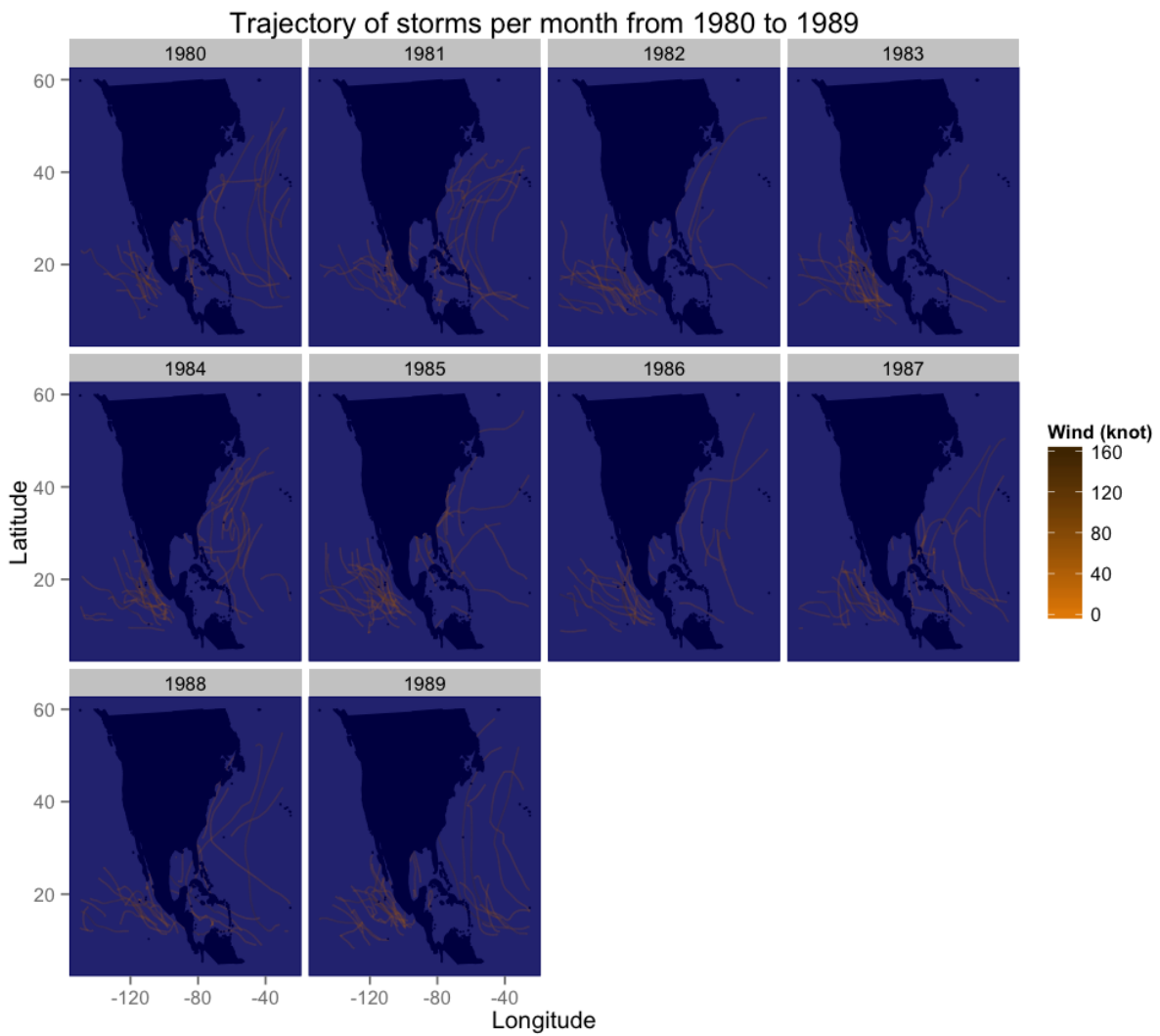
Visulization 1: Trajectory of storms from 1980 to 2010



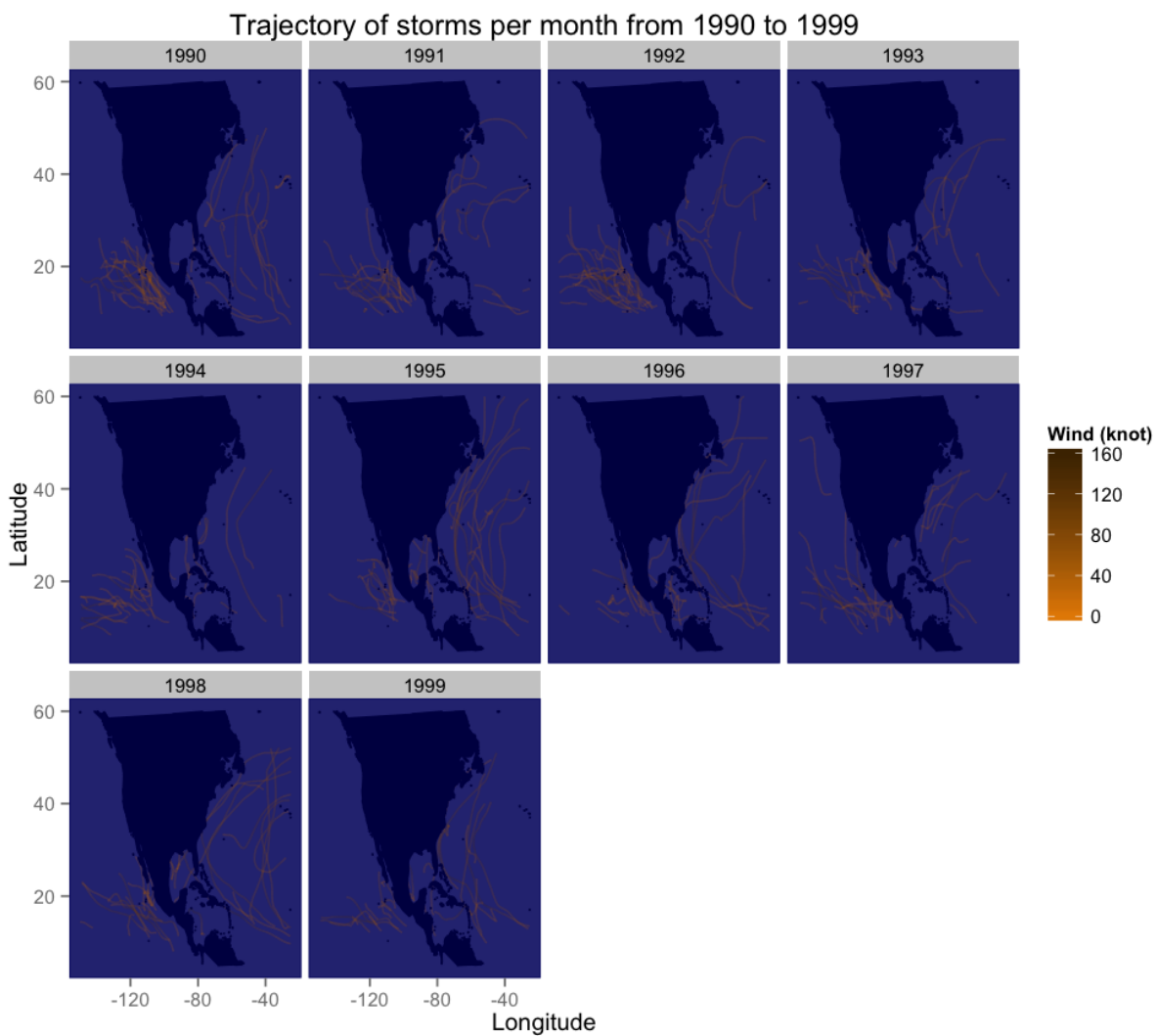
Visualization 2: Trajectory of storms per month from 1980 to 2010 (one facet per month)



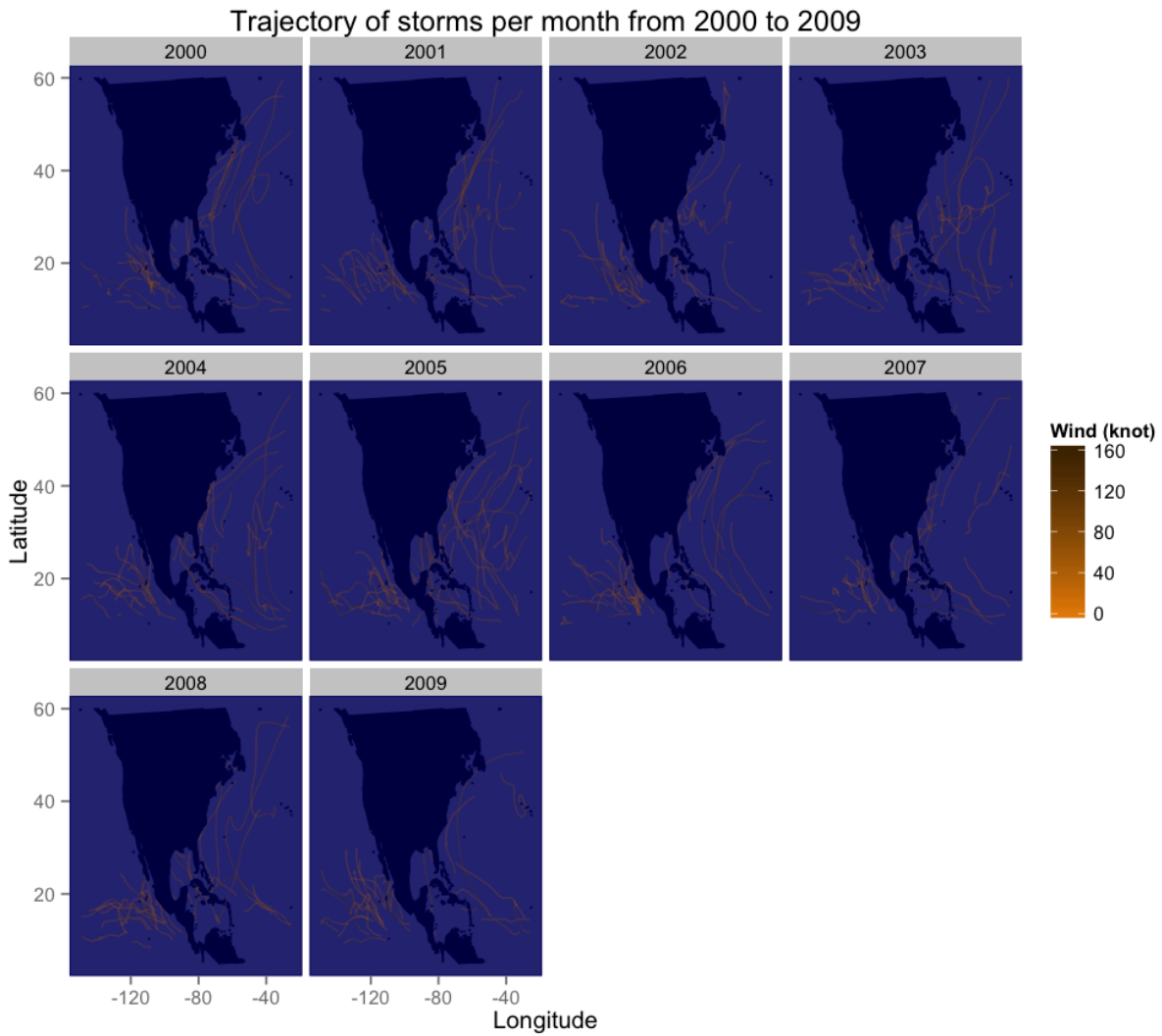
Visualization 3: trajectory of storms in decade 1980s (one facet per year)



Visualization 4: trajectory of storms in decade 1990s (one facet per year)



Visualization 5: trajectory of storms in decade 2000s (one facet per year)



Extra Credit:

Github: https://github.com/isaac1zq/stat133_project.git

LinkedIn: <https://www.linkedin.com/pulse/storm-project-tong-zhang?trk=prof-post>