

Analysis - Hurricanes

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```
library(tidyverse)
library(ggplot2)
library(plotly)
library(ggthemes)
```

```
hurs_all <- read_csv("hurricanes.csv") %>% arrange(Key, Year, Month, Day, Hour)
```

```
## Warning: 29626 parsing failures.
## row col expected actual file
## 1677 SE34 1/0/T/F/TRUE/FALSE 50 'hurricanes.csv'
## 1677 SW34 1/0/T/F/TRUE/FALSE 50 'hurricanes.csv'
## 1678 SE34 1/0/T/F/TRUE/FALSE 50 'hurricanes.csv'
## 1678 SW34 1/0/T/F/TRUE/FALSE 50 'hurricanes.csv'
## 1679 NE34 1/0/T/F/TRUE/FALSE 60 'hurricanes.csv'
## ....
## See problems(...) for more details.
```

```
hurs_all$Decade <- round(hurs_all$Year-5, digits = -1)
write_csv(hurs_all, "hurricanes_w_Decade.csv")
```

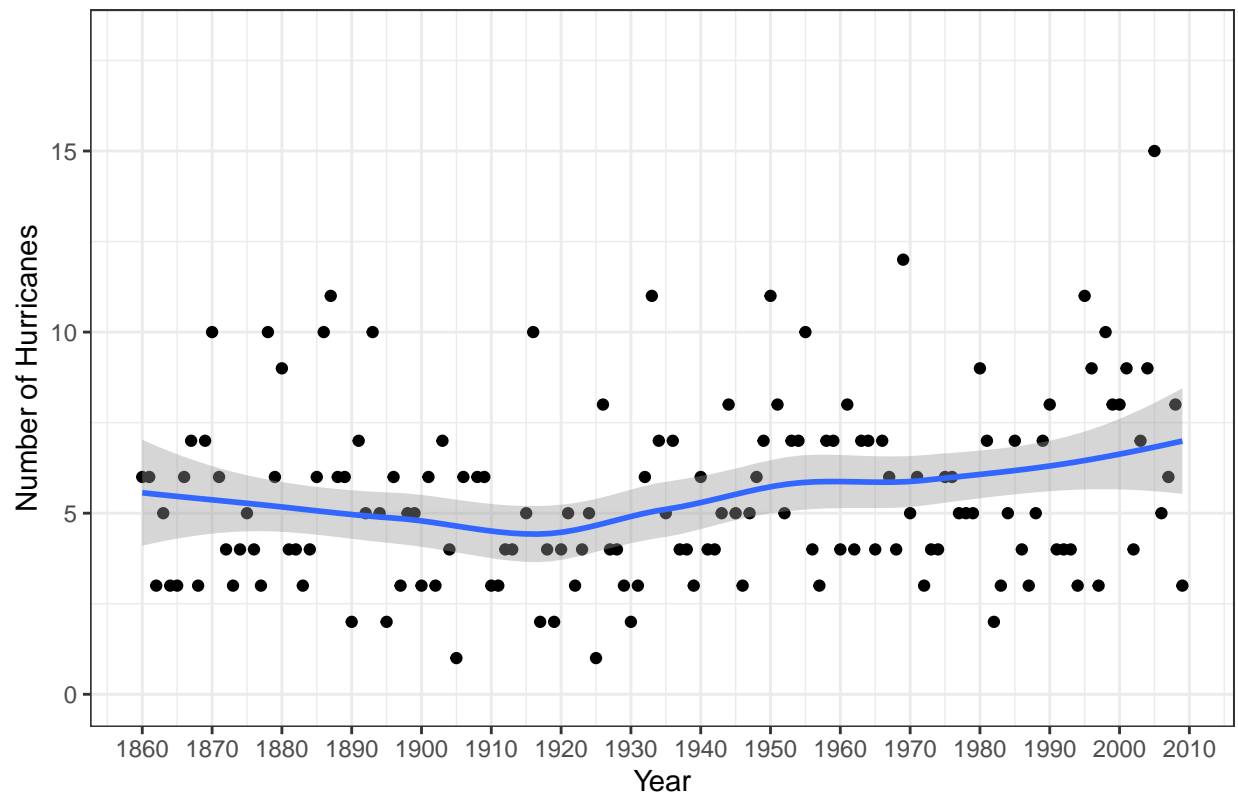
```
# Here are a count of hurricanes per year
hurs_year_key <- hurs_all %>%
  filter(Wind>=64) %>%
  filter(Year>=1860, Year < 2010) %>% #filter out incomplete decades
  group_by(Year, Key) %>%
  summarise(`Number of Records with a Hurricane` = n())

hurs_year <- hurs_year_key %>%
  group_by(Year) %>%
  summarise(`Number of Hurricanes` = n())

write_csv(hurs_year, "hurricanes_per_year.csv")

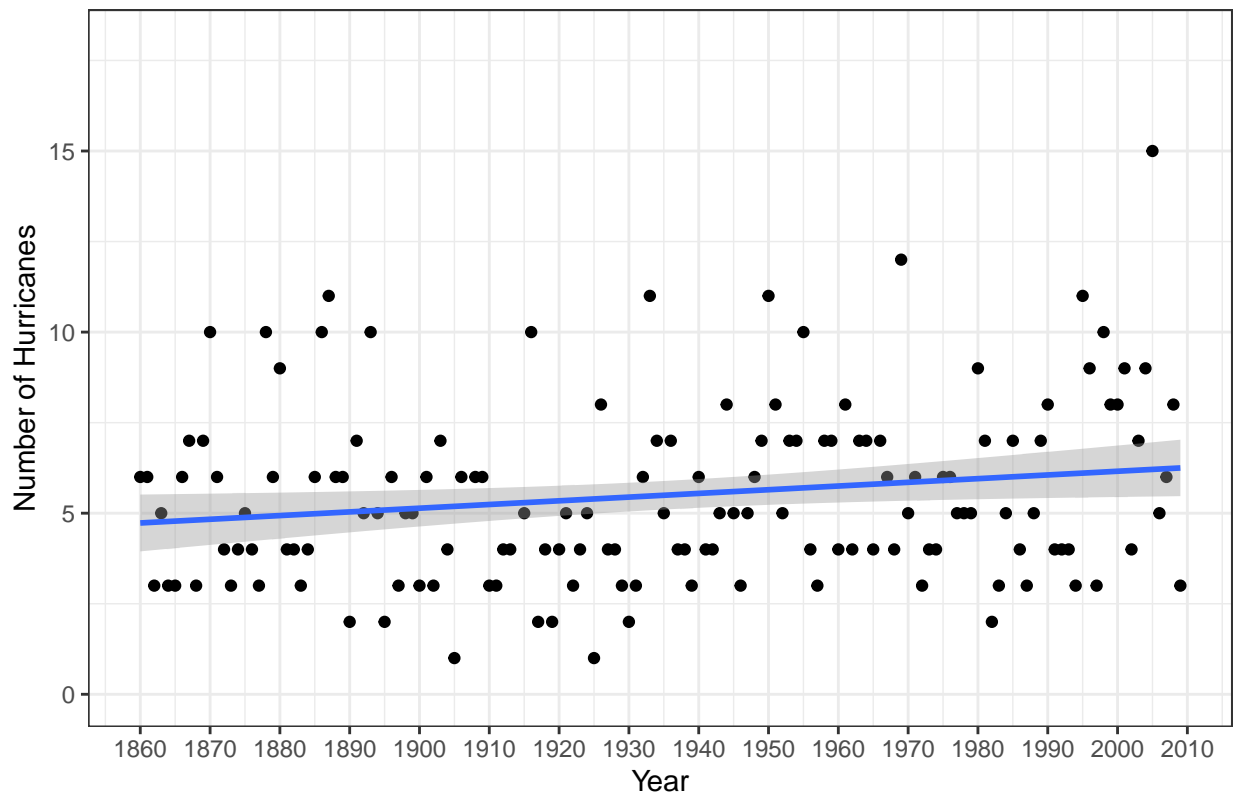
# plot number of hurricanes per year
ggplot(data=hurs_year, aes(x=Year, y=`Number of Hurricanes`)) +
  geom_point() + theme_bw() +
  scale_x_continuous(breaks=seq(from = 1860, to = 2010, by = 10)) +
  scale_y_continuous(limits=c(0, max(hurs_year$`Number of Hurricanes`)*1.2)) +
  labs(title="Hurricanes per Year") + geom_smooth(method = "loess")
```

Hurricanes per Year



```
ggplot(data=hurs_year, aes(x=Year, y=`Number of Hurricanes`)) +
  geom_point()+ theme_bw() +
  scale_x_continuous(breaks=seq(from = 1860, to = 2010, by = 10)) +
  scale_y_continuous(limits=c(0, max(hurs_year$`Number of Hurricanes`)*1.2)) +
  labs(title="Hurricanes per Year") + geom_smooth(method = "lm")
```

Hurricanes per Year

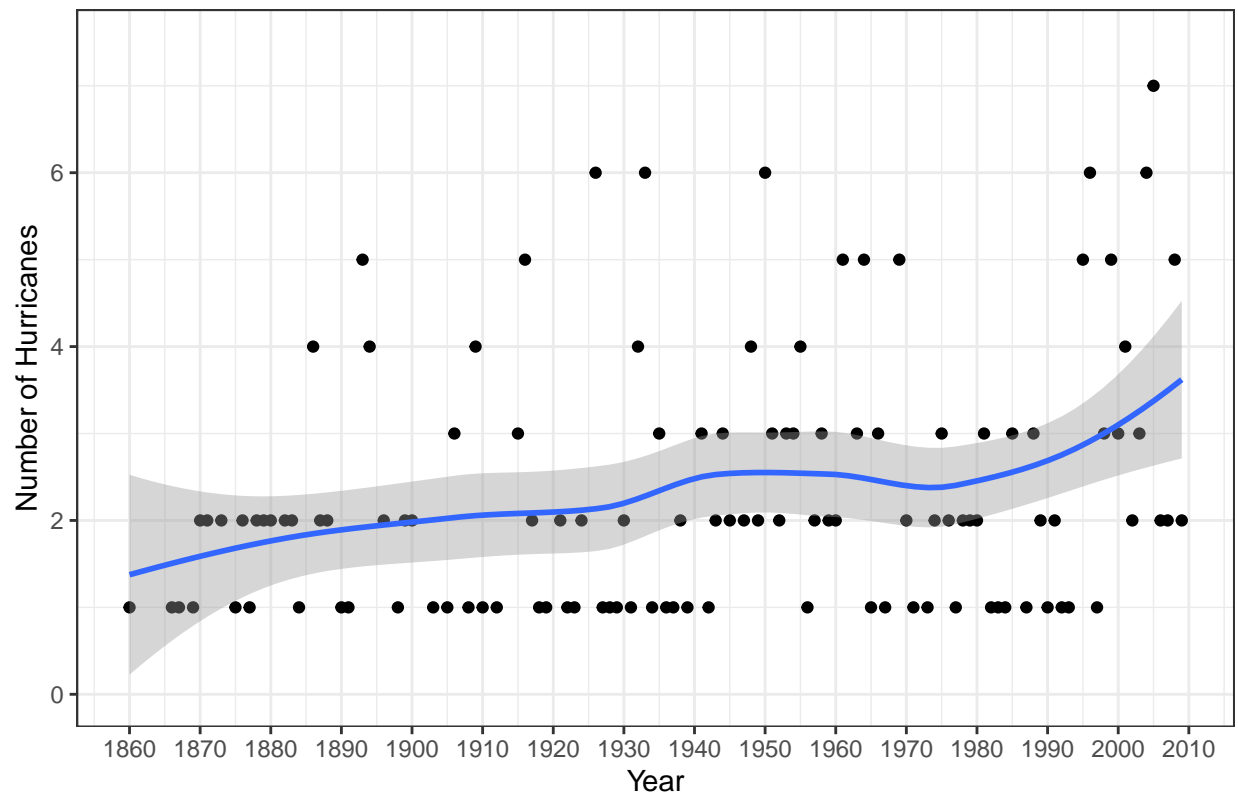


```
# Here are a count of "big" hurricanes per year
big_hurs_year_key <- hurs_all %>%
  filter(Wind>=96) %>%
  filter(Year>=1860, Year < 2010) %>% #filter out incomplete decades
  group_by(Year, Key) %>%
  summarise(`Number of Days with a Hurricane` = n())
big_hurs_year <- big_hurs_year_key %>%
  group_by(Year) %>%
  summarise(`Number of Hurricanes` = n())

write_csv(big_hurs_year, "big_hurricanes_per_year.csv")

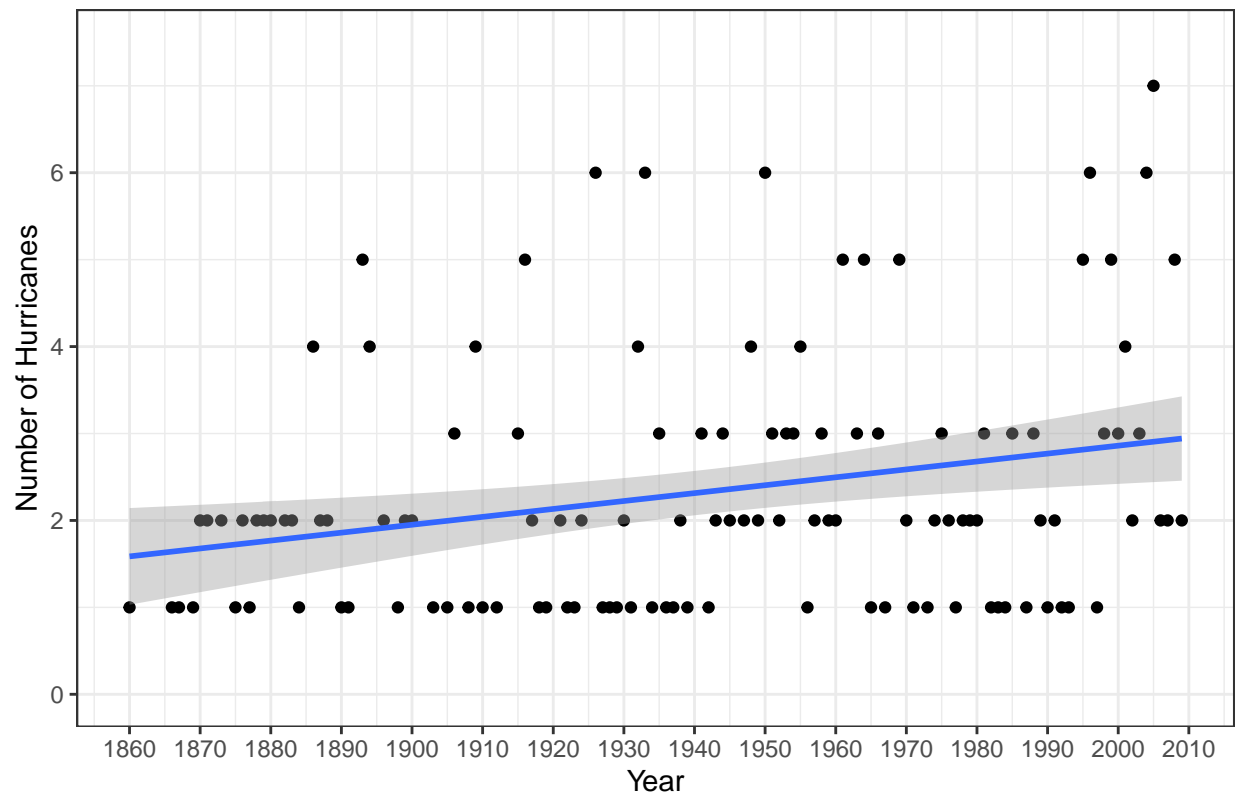
# plot number of "big" hurricane days per year (loess)
ggplot(data=big_hurs_year, aes(x=Year, y=`Number of Hurricanes`)) +
  geom_point() + theme_bw() +
  scale_x_continuous(breaks=seq(from = 1860, to = 2010, by = 10)) + scale_y_continuous(limits=c(0,7.5))
labs(title="Sandy-Like Hurricane Days per Year (Category 3 and Up)") + geom_smooth(method = "loess")
```

Sandy–Like Hurricane Days per Year (Category 3 and Up)



```
# plot number of "big" hurricane days per year (lm)
ggplot(data=big_hurs_year, aes(x=Year, y=`Number of Hurricanes`)) +
  geom_point() + theme_bw() +
  scale_x_continuous(breaks=seq(from = 1860, to = 2010, by = 10)) + scale_y_continuous(limits=c(0,7.5))
labs(title="Sandy-Like Hurricane Days per Year (Category 3 and Up)") + geom_smooth(method = "lm")
```

Sandy–Like Hurricane Days per Year (Category 3 and Up)



```
# create dataset with maximum wind speeds per year
```

```
hurs_decade_max <- hurs_all %>%
```

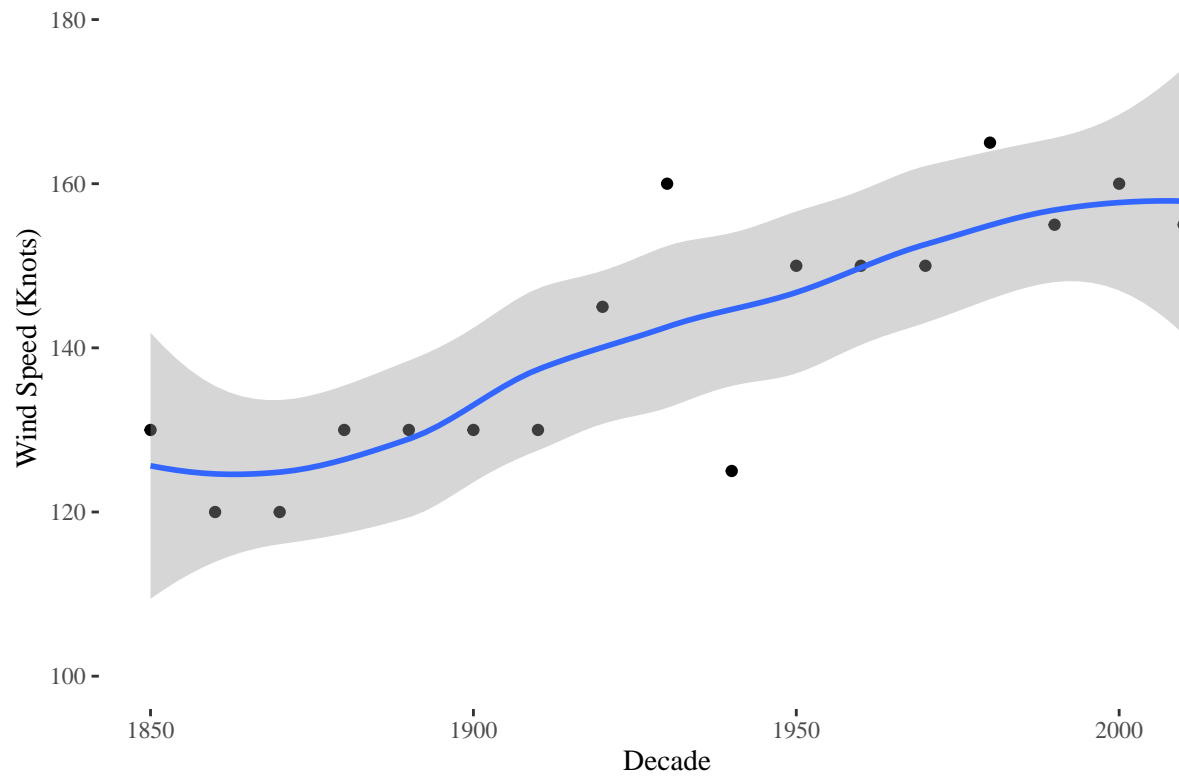
```
  group_by(Decade) %>%
```

```
  summarize(MaxWind = max(Wind))
```

```
# plot maximum wind speed over time
```

```
ggplot(hurs_decade_max, aes(x=Decade, y=MaxWind)) + geom_point() + geom_smooth(method = "loess") + theme_minimal()
```

Maximum Wind Speed Across 17 Decades



```
ggplot(hurs_decade_max, aes(x=Decade, y=MaxWind)) + geom_point() + geom_smooth(method = "lm") + theme_t
```

Maximum Wind Speed Across 17 Decades

