Layer Aesthetic and Geometric Plot Features

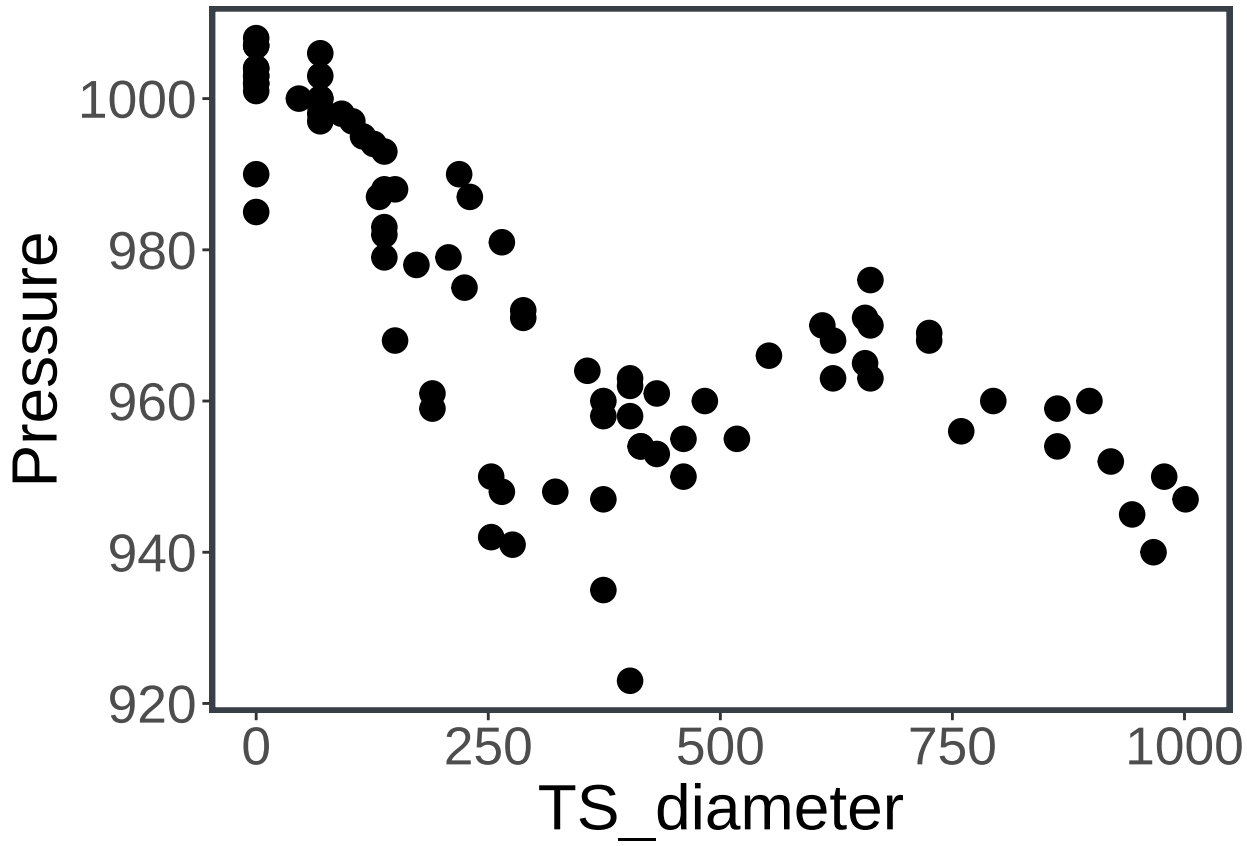
Step 1: Set the theme and load your data.

```
# 1) Set up the theme used in these videos:
library(ggplot2)

theme <-  theme(plot.margin = margin(5, 5, 5, 5, "pt"),
          panel.grid.major = element_blank(),
          panel.grid.minor = element_blank(),
          panel.background = element_blank(),
          panel.border = element_rect(colour = "#393f47", fill = NA, size = 2),
          axis.text = element_text(size = 20),
          axis.title.x = element_text(size = 24),
          axis.title.y = element_text(size = 24),
          plot.title = element_text(face = "bold", size = 30))

ourTheme <- list(theme,

scale_color_manual(values = c('#393f47', '#b31b1b', '#fbb040', '#92b2c4')))

# 2) Load data from the National Oceanic and Atmospheric Administration's
# Atlantic hurricane database and convert variables to factors where necessary:
library(tidyverse)

# read in the storm data:
storms <- read.csv("storms.csv")

# set the storm category to be a factor:
storms$Category <- factor(storms$Category, levels = -1:5)

# set the measurement date/time to be a factor:
storms$Date <- factor(storms$Date, levels = unique(storms$Date))

# look at the storm data:
# View(storms)

# 3) Filter the data to only use observations for Hurricane Sandy:
sandy <- storms %>% filter(Name == "Sandy")

# 4) Create a data set with observations only for Hurricanes Katrina, Sandy, and Wilma:
sampleStorms <- storms %>%
filter(Name %in% c("Katrina", "Sandy", "Wilma"))
```

Step 2: Make a scatterplot relating TS_diameter to pressure.

Create a scatterplot:

```
ggplot(data = sampleStorms, aes(x = TS_diameter, y = Pressure)) +
        geom_point(size = 4) +
        ourTheme
```

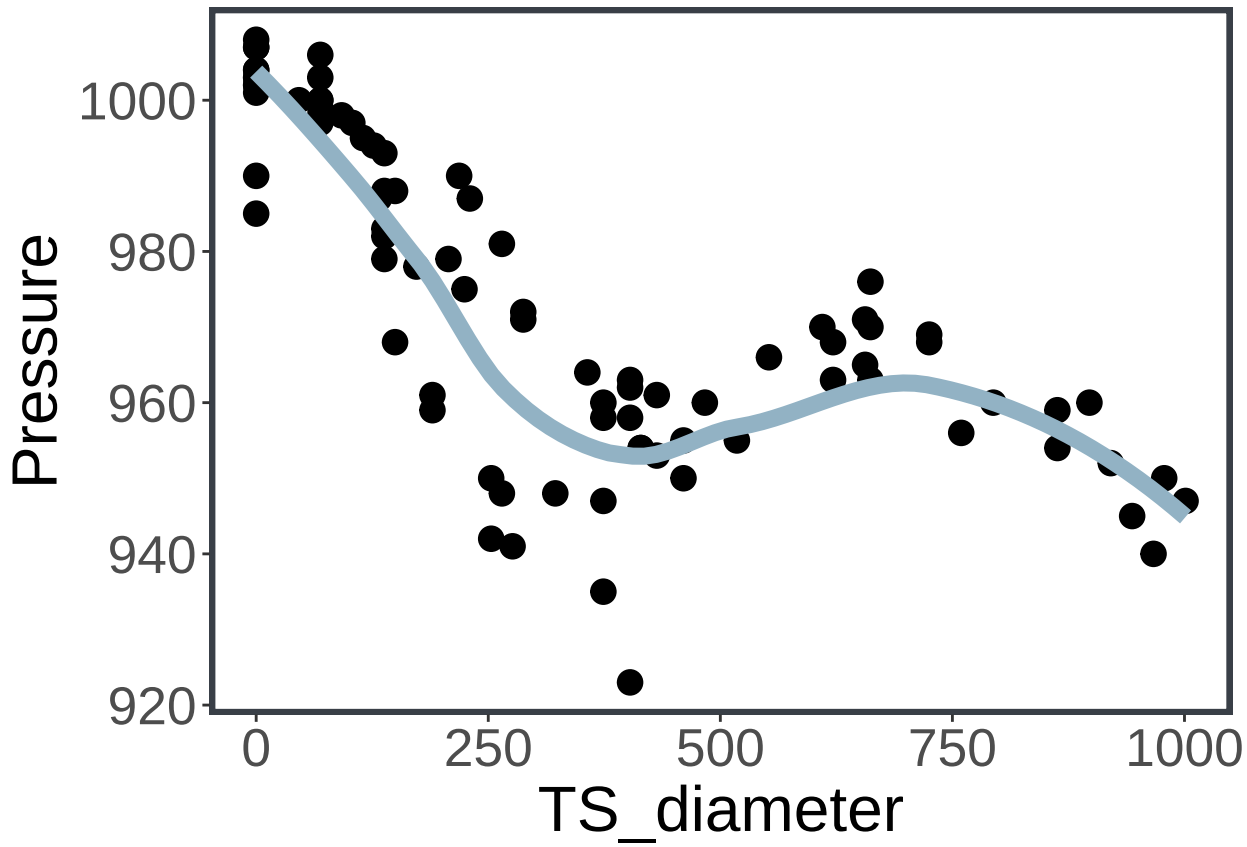


Step 3. Overlay a curve on the scatterplot.

Use the function geom_smooth() to add a curve to the scatterplot. The geom_smooth() function takes size and color as arguments, as well as an argument called se that tells R whether or not to plot confidence intervals:

```
# use geom_smooth() to add a curve to the scatterplot
# the size (thickness) and color of the line are adjusted to make viewing easier
ggplot(data = sampleStorms, aes(x = TS_diameter, y = Pressure)) +
        geom_point(size = 4) +
        geom_smooth(se = FALSE, size = 3, color = '#92b2c4') +
        ourTheme
```

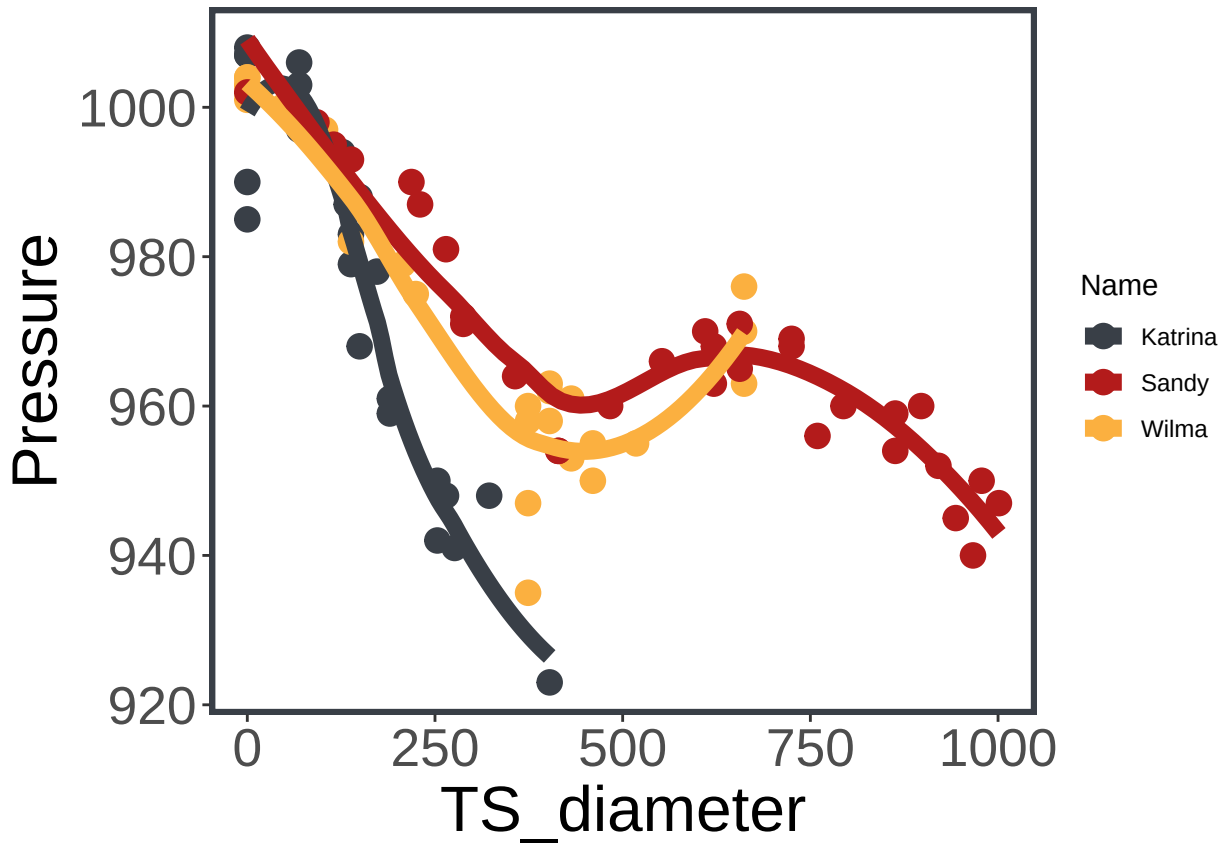
```
## Warning: Using ‘size‘ aesthetic for lines was deprecated in ggplot2 3.4.0.
## i Please use ‘linewidth‘ instead.
## This warning is displayed once every 8 hours.
## Call ‘lifecycle::last_lifecycle_warnings()‘ to see where this warning was
## generated.
```



Step 4: Color points by group and overlay a curve for each group.

Adding color = Name to the aes() function means that each storm will be displayed in a different color. Since color = Name is inside the aesthetic function of the main layer, these colors will be used for both geometric objects (points as well as curves):

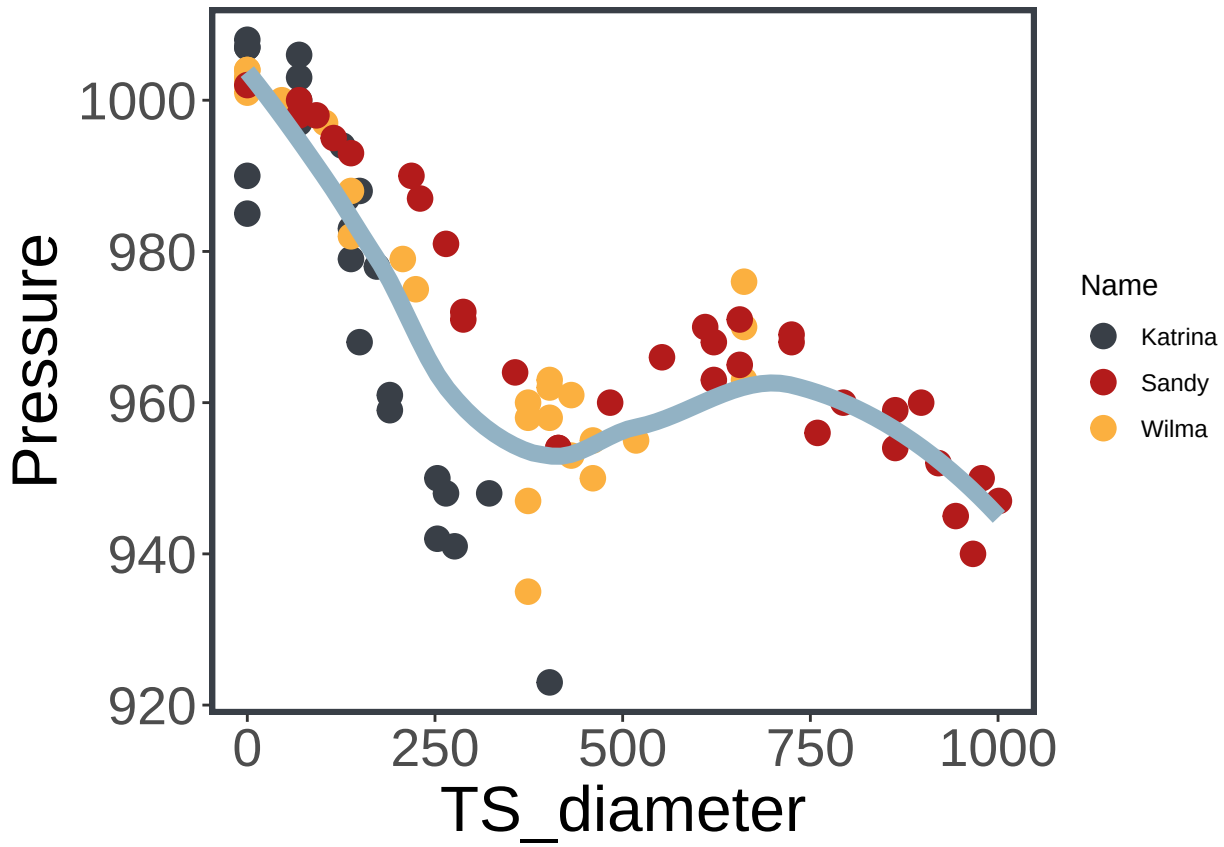
```
ggplot(data = sampleStorms, aes(x = TS_diameter, y = Pressure, color = Name)) +
        geom_point(size = 4) +
        geom_smooth(se = FALSE, size = 3) +
        ourTheme
```



Step 5: Color points by group but overlay a curve for all points.

If you only want to make a change to one layer of a plot, you can adjust the aes() function in the individual plot layer. Here, there is a second aes() function within the geom_point() function, so the color = Name aesthetic only applies to points:

```
ggplot(data = sampleStorms, aes(x = TS_diameter, y = Pressure)) +
        geom_point(aes(color = Name), size = 4) +
        geom_smooth(se = FALSE, size = 3, color = "#92b2c4") +
        ourTheme
```


Pressure
1000
980
960
940
920
0
250
500
750
1000
TS_diameter
Name
Katrina
Sandy
Wilma