Yugo and Bentley Hydrocarbon (HC) Emissions

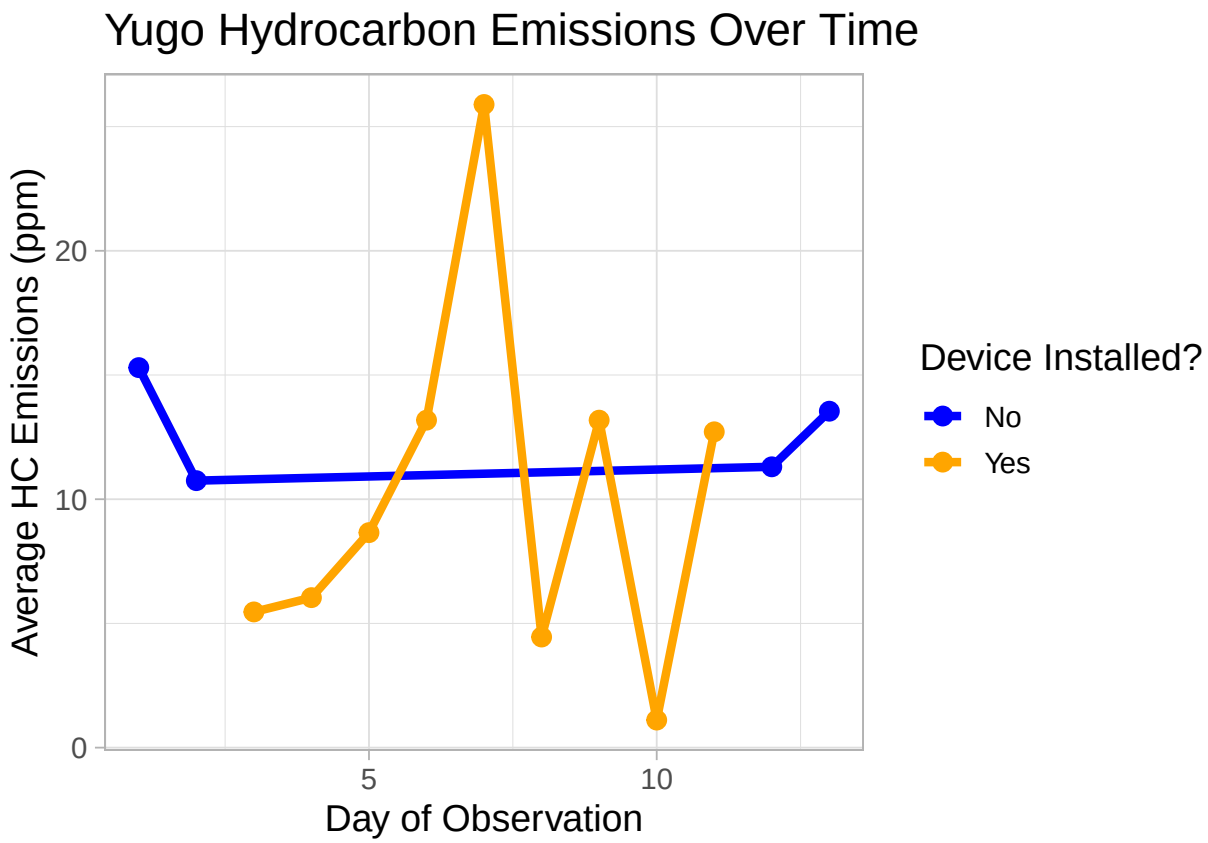
2025-03-04

```
carData <- read_csv("carData.csv")
```

```
Yugo_hc_emissions <- carData |>
  select(day, hc, car, dev) |>
  mutate(dev = ifelse(dev > 0, "Yes", "No")) |> #Ensuring that device is either T or F
  filter(car == "Yugo") |>
  group_by(dev, day) |>
  summarise(avg_emission = mean(hc, na.rm = TRUE))

Yugo_hc_plot <- ggplot(Yugo_hc_emissions, aes(x = day, y = avg_emission, colour = dev, group = dev)) +
  geom_line(linewidth = 1.5) +
  geom_point(size = 3) +
  scale_color_manual(values = c("Yes" = "orange", "No" = "blue")) +
  labs(
    title = "Yugo Hydrocarbon Emissions Over Time",
    x = "Day of Observation",
    y = "Average HC Emissions (ppm)",
    colour = "Device Installed?"
  ) +
  theme_light(base_size = 14)

Yugo_hc_Caption <- "The graph shows that Yugos with the device had highly variable hydrocarbon emissions
```


Yugo Hydrocarbon Emissions Over Time
Average HC Emissions (ppm)
0
10
20
5
10
Day of Observation
Device Installed?
No
Yes

```r
Bentley_hc_emissions <- carData |>
  select(day, hc, car, dev) |>
  mutate(dev = ifelse(dev > 0, "Yes", "No")) |> #Ensuring that device is either T or F
  filter(car == "Bentley") |>
  group_by(dev, day) |>
  summarise(avg_emission = mean(hc, na.rm = TRUE))

Bentley_hc_plot <- ggplot(Bentley_hc_emissions, aes(x = day, y = avg_emission, colour = dev, group = dev
  geom_line(linewidth = 1.5) +
  geom_point(size = 3) +
  scale_color_manual(values = c("Yes" = "orange", "No" = "blue")) +
  labs(
    title = "Bentley Hydrocarbon Emissions Over Time",
    x = "Day of Observation",
    y = "Average HC Emissions (ppm)",
    colour = "Device Installed?"
  ) +
  theme_light(base_size = 14)
```

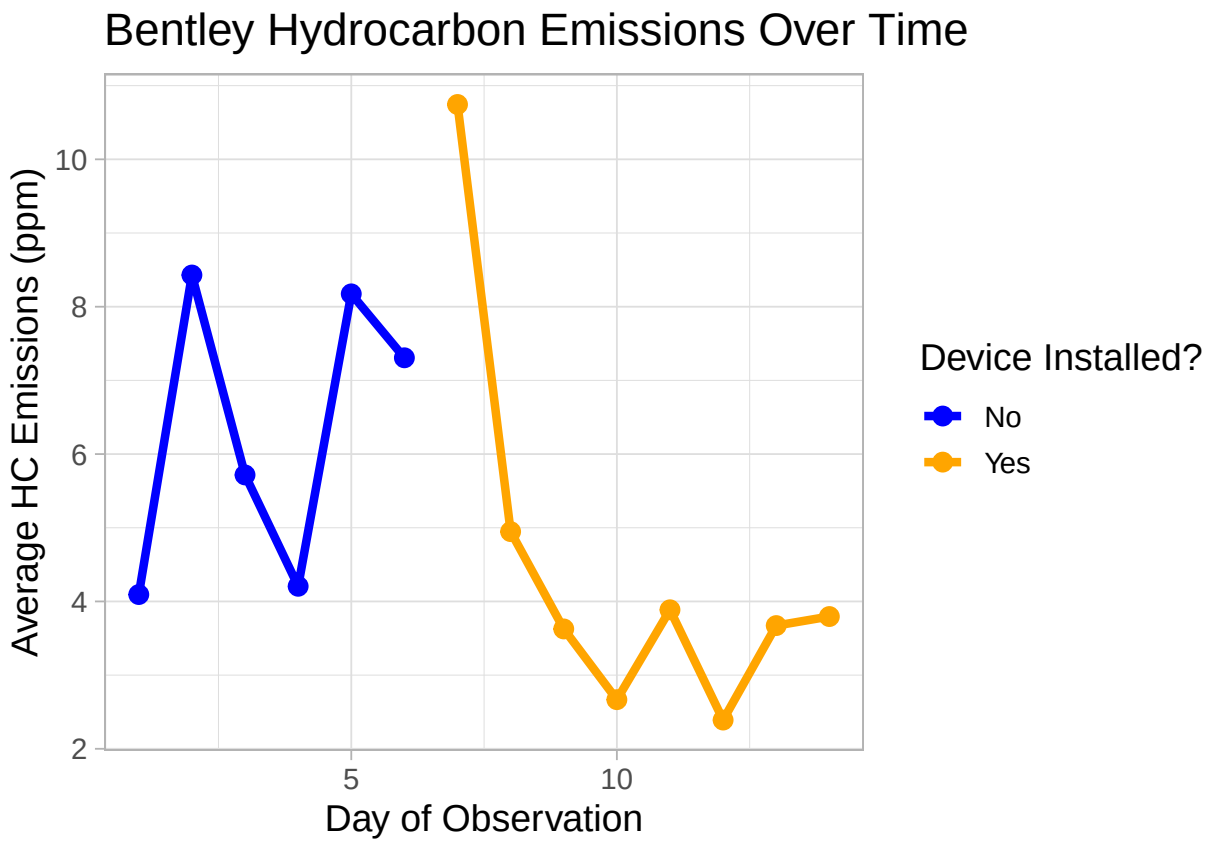


Figure 1: The graph shows that after the device was installed, the Bentley's average hydrocarbon emissions dropped substantially. Prior to the device installation, the mean hydrocarbon emissions ranged from 4.09 ppm to 7.3 ppm. Emissions reached a maximum (10.7 ppm) on the day the device was installed, but dropped to 4.9 ppm the next day. Thereafter, average Bentley hydrocarbon emissions were consistently below 4.0 ppm.