data_wrangling

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#Data Visualization

```
#ggplot(USGS_NOAA_combined, aes(x= DATE, y = gage_height, color = PRCP)) +
  #geom_point(size = 0.5, alpha = 0.5) +
  #scale_color_gradientn(colors = rainbow(5), limits = c(0,0.5), breaks = c(0, 0.25, 0.5))

#tmax_plot <- ggplot(USGS_NOAA_combined, aes(x = DATE, y = TMAX_C)) +
  #geom_point(size = 0.5, alpha = 0.5, shape = 1) +
  #labs(x = "Date", y = "Max Daily Temperature (degree C)")
#print(tmax_plot)

gage_height_plot <- ggplot(USGS_NOAA_combined, aes(x = DATE, y = gage_height)) +
  geom_line(color = "dodgerblue2") +
  labs(x = "Date", y = "Gage Height (ft)") +
  ylim(0, 10)
#print(gage_height_plot)

PRCP_plot <- ggplot(USGS_NOAA_combined, aes(x = DATE, y = PRCP)) +
  geom_point(shape = 1, size = 0.5, color = "indianred2") +
  labs(x = "Date", y = "Precipitation (in)") +
  ylim(0, 8)
#print(PRCP_plot)

snow_plot <- ggplot(USGS_NOAA_combined, aes(x = DATE, y = SNOW)) +
  geom_point(size = 0.5, shape = 8, color = "plum3", alpha = 0.5) +
  labs(x = "Date", y = "Snow Fall (in)") +
  ylim(0, 45)
#print(snow_plot)

tmin_plot <- ggplot(USGS_NOAA_combined, aes(x = DATE, y = TMIN_C, fill = TMIN_C > 0)) +
  geom_bar(stat = "identity")+
  labs(x = "Date", y = expression(paste("Minimum Temperature",degree,"C"))) +
  ylim(-25, 25) +
  scale_fill_manual(values = c("blue4", "red2")) +
  theme(legend.position = "none",
        plot.caption = element_text(hjust = 0, face = "italic"))
#print(tmin_plot)

graphs_combined <- plot_grid(gage_height_plot, PRCP_plot, snow_plot, tmin_plot,
                             labels = "AUTO",
                             align = "h",
                             axis = "b")
```

```
## Warning: Removed 17977 rows containing missing values (geom_path).
```

```
## Warning: Removed 526 rows containing missing values (geom_point).
```

```
## Warning: Removed 2668 rows containing missing values (geom_point).
```

```
## Warning: Removed 438 rows containing missing values (position_stack).
```

```
#caption <- ggdraw() +
 # draw_figure_label("Figure 1: Lake Tahoe climate data and water level time series. (A) Gage height me
            # position = "bottom.left",
           #  x = 0,
            # y =0,
            # size = 10)

#snow_plot <- ggplot(USGS_NOAA_combined, aes(x = DATE, y = SNOW)) +
  #geom_point(size = 0.5, shape = 8, color = "plum3", alpha = 0.5) +
  #labs(x = "Date", y = "Snow Fall (in)", caption = "Figure 1: Lake Tahoe climate data and water level
     #  (lake level) in feet where the lake elevation is measured at 6,220 feet. Lake elevation plus
      # daily gage height measurement will give the changes in lake level. (B) Daily precipitation
       #in Tahoe City, CA. (C) Daily snow fall in Tahoe City, CA. (D) Daily minimum temperatures in
       #Tahoe City, CA.") +
 # ylim(0, 45) +
  #theme(plot.caption = element_text(hjust = 0, face = "italic"))

#plot_grid(graphs_combined)
```

```
plot_grid(graphs_combined)
```

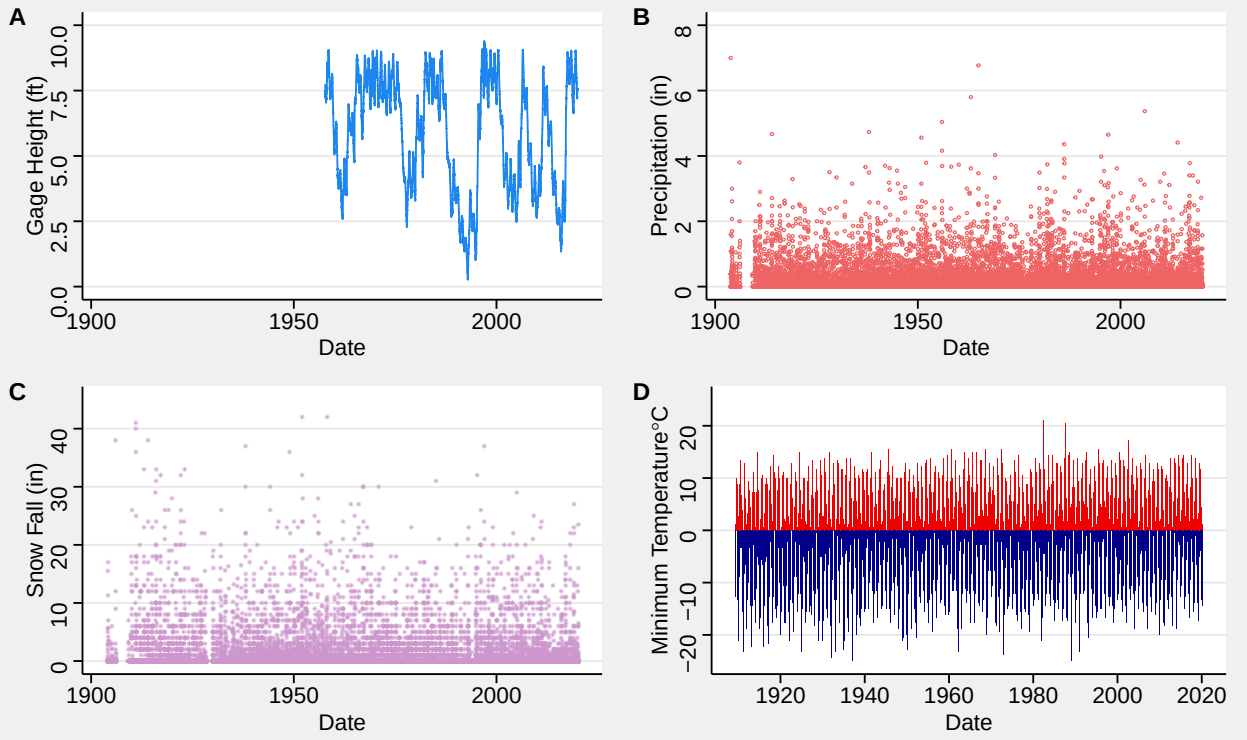

Figure 1: Lake Tahoe climate data and water level time series. (A) Gage height measurements (lake level) in feet where the lake elevation is measured at 6,220 feet. Lake elevation plus daily gage height measurement will give the changes in lake level. (B) Daily precipitation in Tahoe City, CA. (C) Daily snow fall in Tahoe City, CA. (D) Daily minimum temperatures in Tahoe City, CA.