1 Data Description

This data was collected on September 20, 2016 along 3 reaches of the Santa Ana River, with 9 observations per reach. Site 4 (plunge pool): 34°2'5" N, 117 °21'17" W Site 3 (below confluence): 34°2'21" N, 117 °21'20" W Site 2 (above confluence): 34 °2'29" N, 117°21'15" W. Site 1 (concrete channel) was used by other groups but not by us. Each observation contains the following variables: algae percent cover, canopy cover, water temperature, bed composition.

1.1 Importing Data

The following code was used to import data into rstudio, assign a file path, and create a command to read the csv file.

```
updateddata= "/home/CAMPUS/fcl02013/Santa-Ana-Sucker-Recovery/Data/Data_TUES_1/updatedtemps.
importupdated=read.csv(updateddata)
summary(importupdated)

##        ID       Site      Algae           Sediment       Temperature
##  Min.   : 1.0   A:9   Min.   :  0.00   Min.   :0.0000   Min.   :28.00
##  1st Qu.: 7.5   B:9   1st Qu.:  0.00   1st Qu.:0.0000   1st Qu.:29.00
##  Median :14.0   C:9   Median : 50.00   Median :1.0000   Median :29.00
##  Mean   :14.0         Mean   : 48.52   Mean   :0.5926   Mean   :28.89
##  3rd Qu.:20.5         3rd Qu.:100.00   3rd Qu.:1.0000   3rd Qu.:29.00
##  Max.   :27.0         Max.   :100.00   Max.   :1.0000   Max.   :30.00
##      Canopy          Site_new    Temp_min        Temp_max
##  Min.   : 0.000   Min.   :2   Min.   :25.12   Min.   :30.25
##  1st Qu.: 3.000   1st Qu.:2   1st Qu.:25.12   1st Qu.:30.25
##  Median :11.000   Median :3   Median :25.90   Median :30.76
##  Mean   : 8.593   Mean   :3   Mean   :26.13   Mean   :30.79
##  3rd Qu.:14.000   3rd Qu.:4   3rd Qu.:27.37   3rd Qu.:31.37
##  Max.   :15.000   Max.   :4   Max.   :27.37   Max.   :31.37
##    Temp_mean       Temp_range
##  Min.   :27.46   Min.   :3.390
##  1st Qu.:27.46   1st Qu.:3.390
##  Median :27.94   Median :5.130
##  Mean   :27.81   Mean   :4.663
##  3rd Qu.:28.03   3rd Qu.:5.470
##  Max.   :28.03   Max.   :5.470
```

1.2 Summary Statistics

The following code was used to generate summary statisitics.

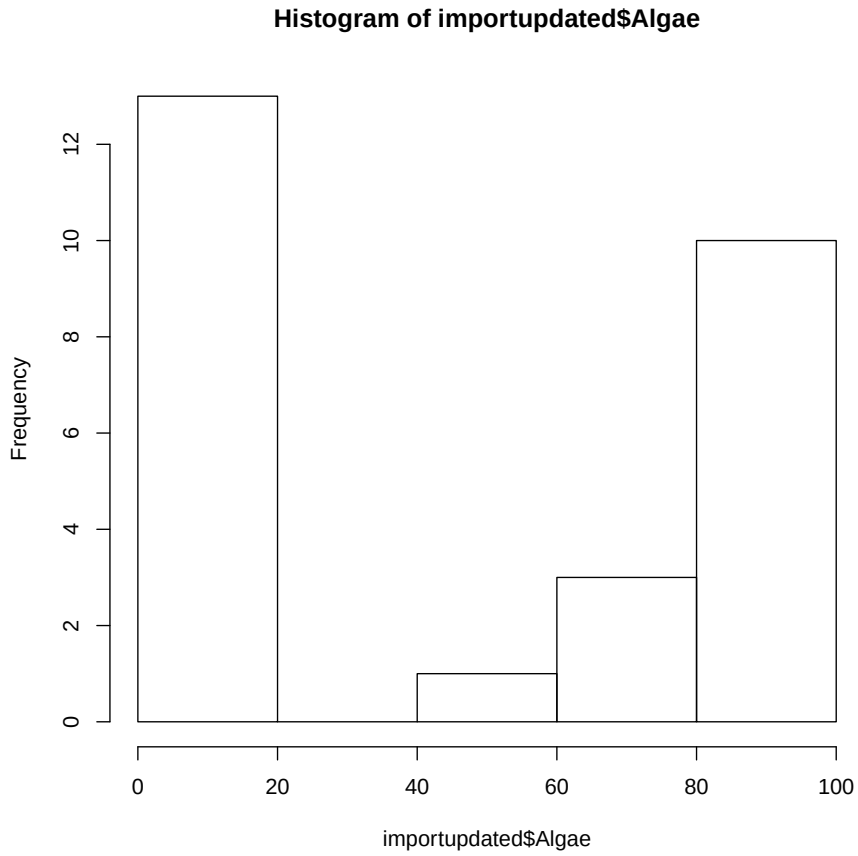
```
summary(importupdated)
```

```
##        ID       Site      Algae           Sediment       Temperature
##  Min.   : 1.0   A:9   Min.   :  0.00   Min.   :0.0000   Min.   :28.00
##  1st Qu.: 7.5   B:9   1st Qu.:  0.00   1st Qu.:0.0000   1st Qu.:29.00
##  Median :14.0   C:9   Median : 50.00   Median :1.0000   Median :29.00
##  Mean   :14.0         Mean   : 48.52   Mean   :0.5926   Mean   :28.89
##  3rd Qu.:20.5         3rd Qu.:100.00   3rd Qu.:1.0000   3rd Qu.:29.00
##  Max.   :27.0         Max.   :100.00   Max.   :1.0000   Max.   :30.00
##      Canopy          Site_new    Temp_min        Temp_max
##  Min.   : 0.000   Min.   :2   Min.   :25.12   Min.   :30.25
##  1st Qu.: 3.000   1st Qu.:2   1st Qu.:25.12   1st Qu.:30.25
##  Median :11.000   Median :3   Median :25.90   Median :30.76
##  Mean   : 8.593   Mean   :3   Mean   :26.13   Mean   :30.79
##  3rd Qu.:14.000   3rd Qu.:4   3rd Qu.:27.37   3rd Qu.:31.37
##  Max.   :15.000   Max.   :4   Max.   :27.37   Max.   :31.37
##    Temp_mean       Temp_range
##  Min.   :27.46   Min.   :3.390
##  1st Qu.:27.46   1st Qu.:3.390
##  Median :27.94   Median :5.130
##  Mean   :27.81   Mean   :4.663
##  3rd Qu.:28.03   3rd Qu.:5.470
##  Max.   :28.03   Max.   :5.470
```

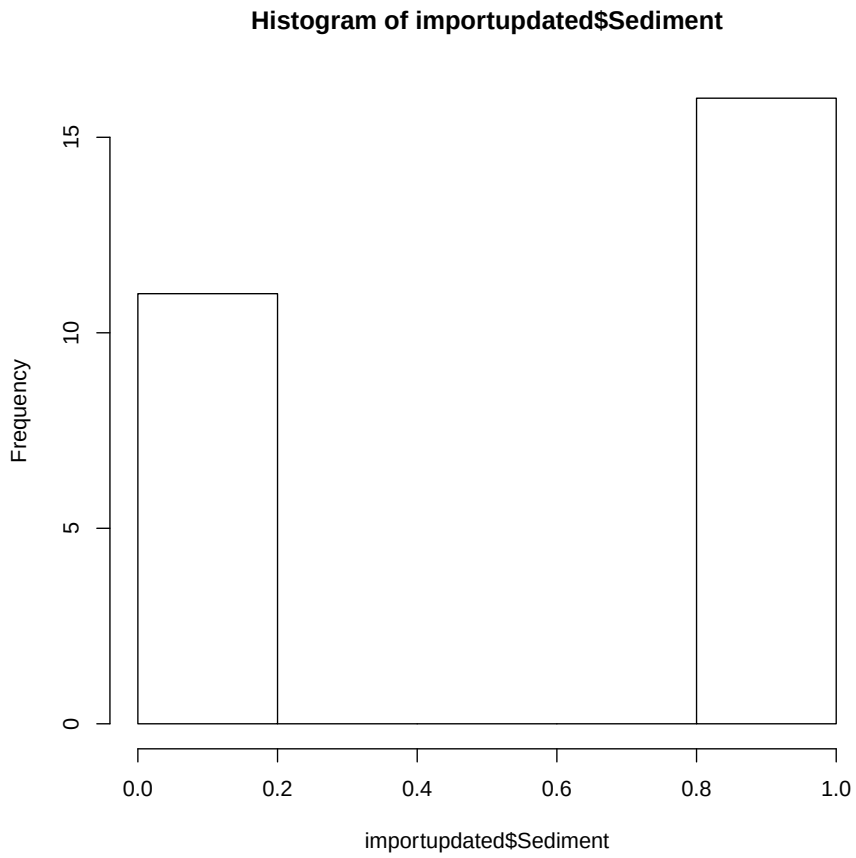
1.3 Distribution

Write some stuff about the summary here...

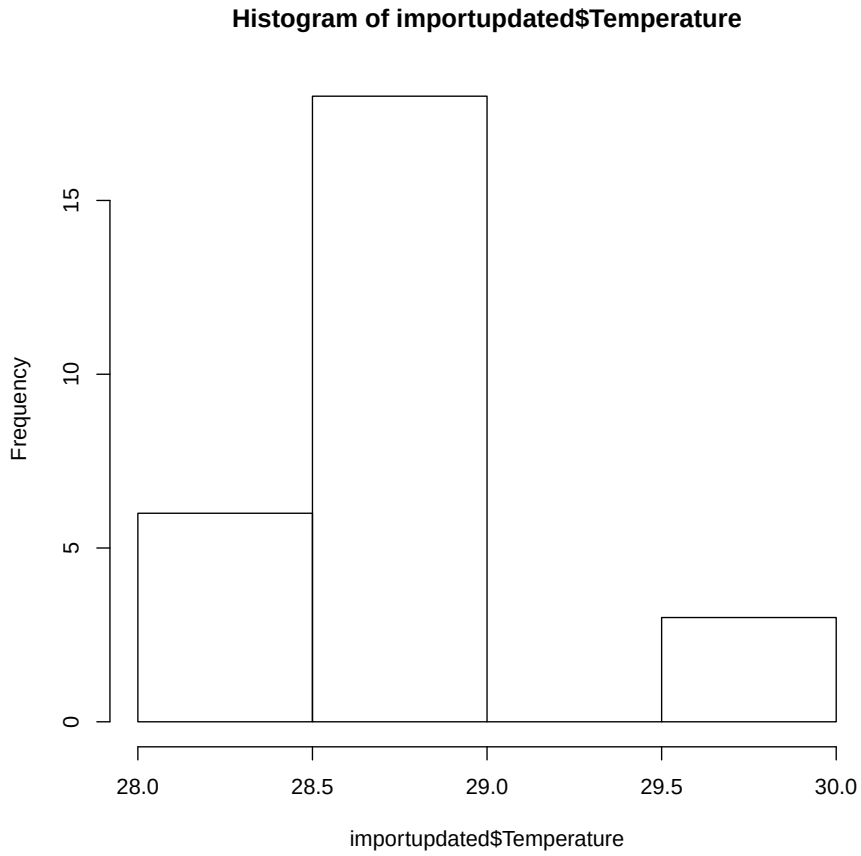
```
hist(importupdated$Algae)
```



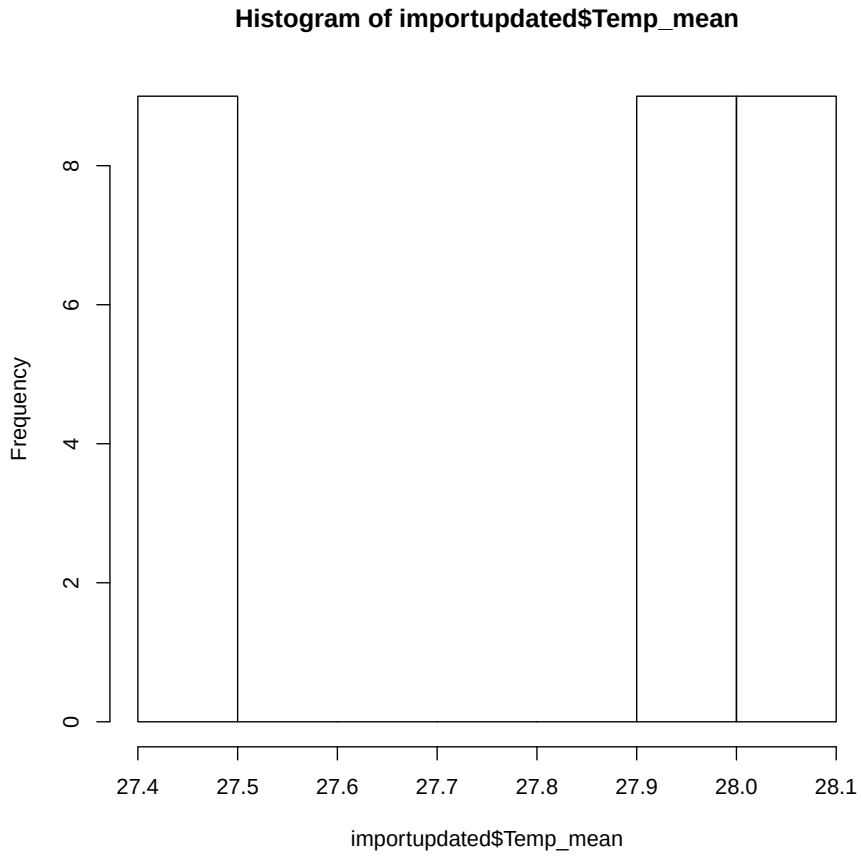

```
hist(importupdated$Sediment)
```



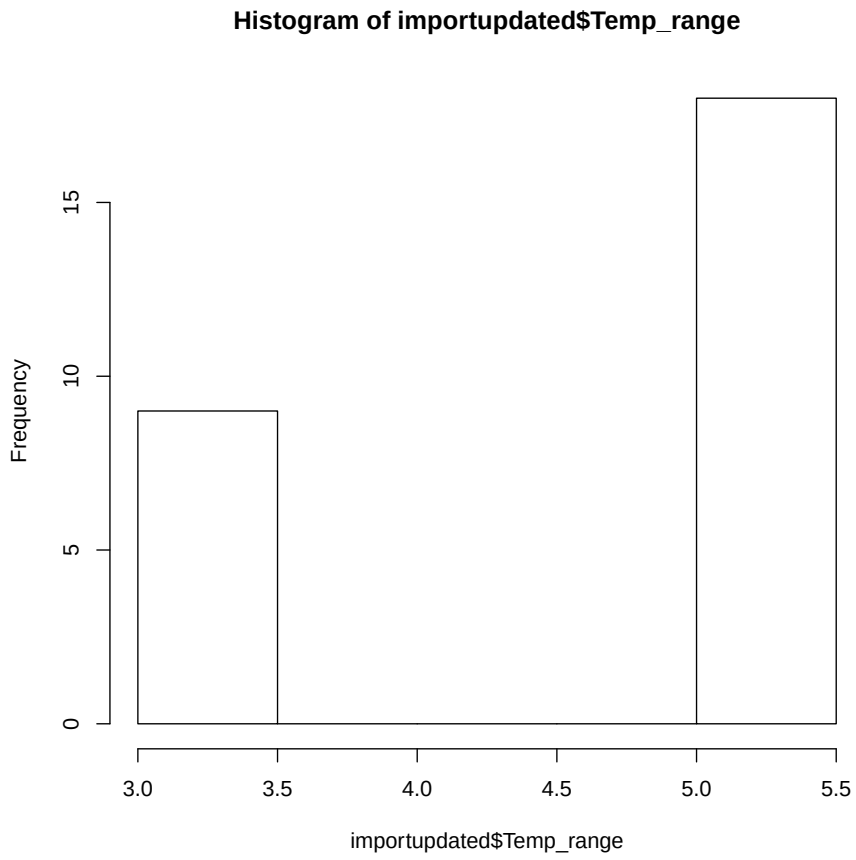

```
hist(importupdated$Temperature)
```



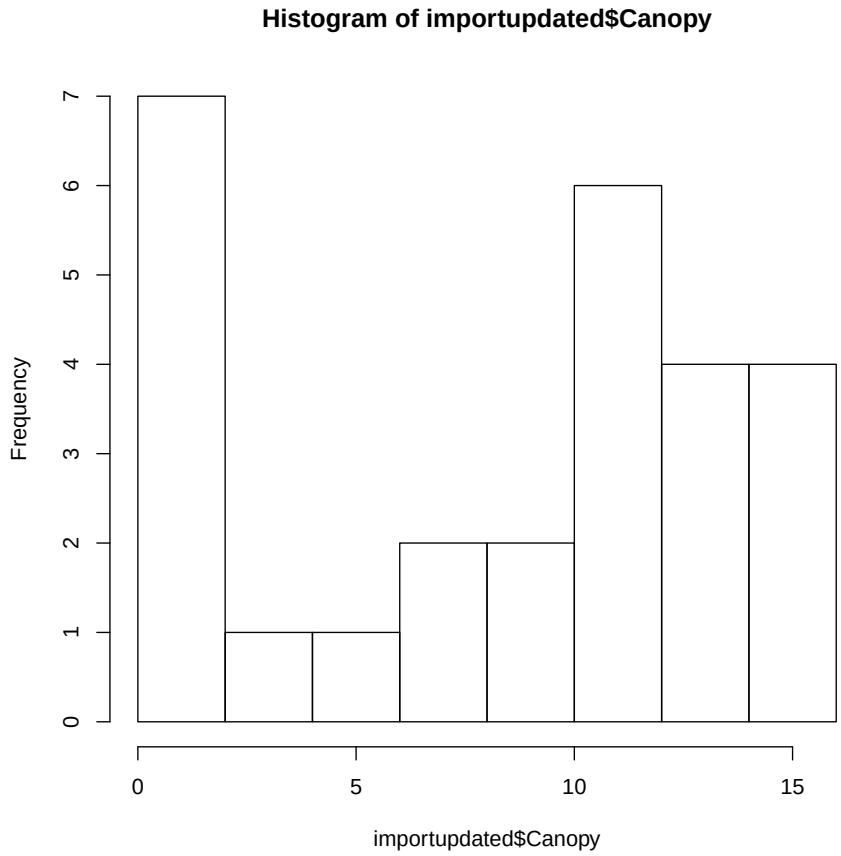

```
hist(importupdated$Temp_mean)
```




```
hist(importupdated$Temp_range)
```




```
hist(importupdated$Canopy)
```



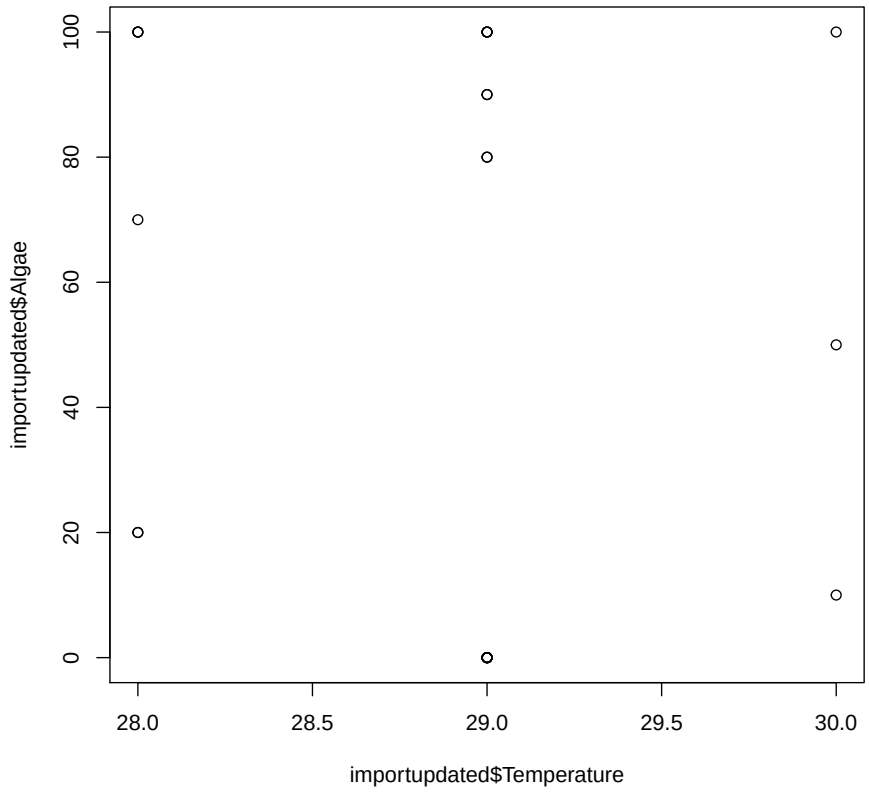
2 Bias and Data Limitations

All data collected on one day, Sept. 20, 2016.

Abnormal event (car accident) occurred a few ? days before data collection which caused the RIX treatment plant to temporarily shut off water outlet pipes, effectively draining the river and adeversely impacting algae populations to an unknown degree. Therefore our measurements likely reflect less-than-typical algae abundance. Our measuremnts were taken by undergraduate students without extensive algae fieldwork experience or training.

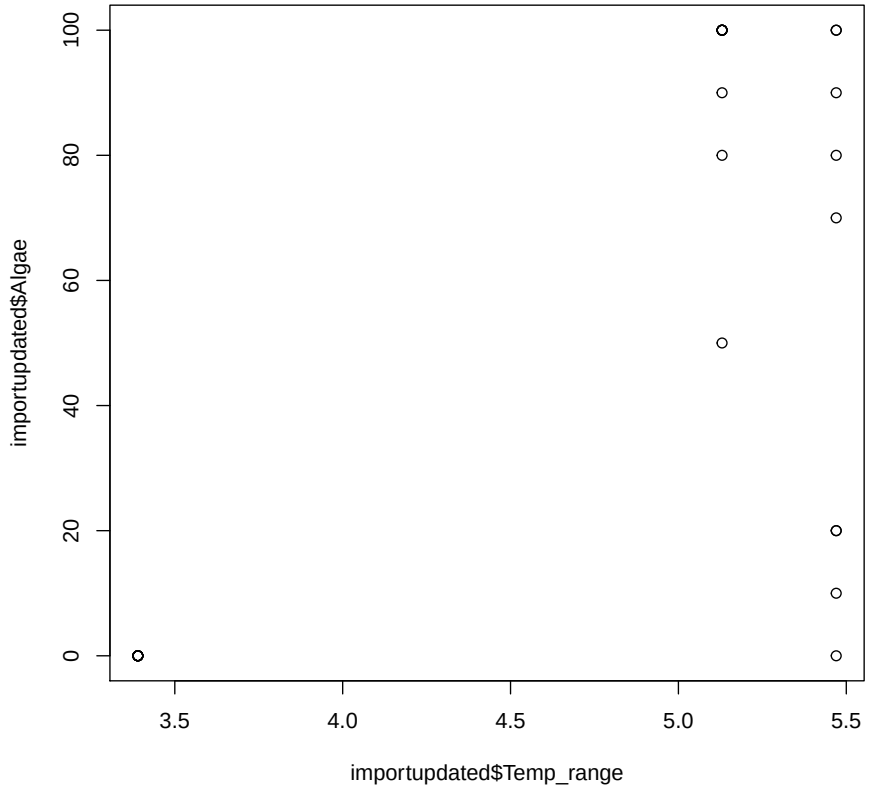
3 Results

```
plot(importupdated$Temperature,importupdated$Algae)
```

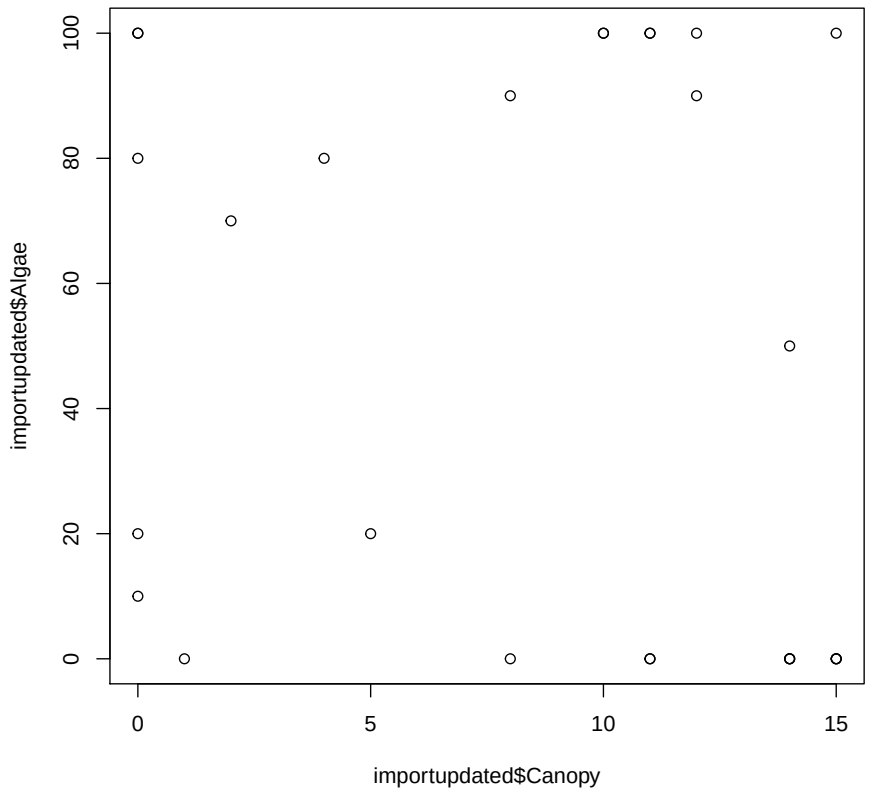


Our temperature data was too coarse to really be useful. So instead we proceeded to use WED1 team's temperature data. The following is a plot of algae abundance as a function the range of temperature.

```
plot(importupdated$Temp_range,importupdated$Algae)
```

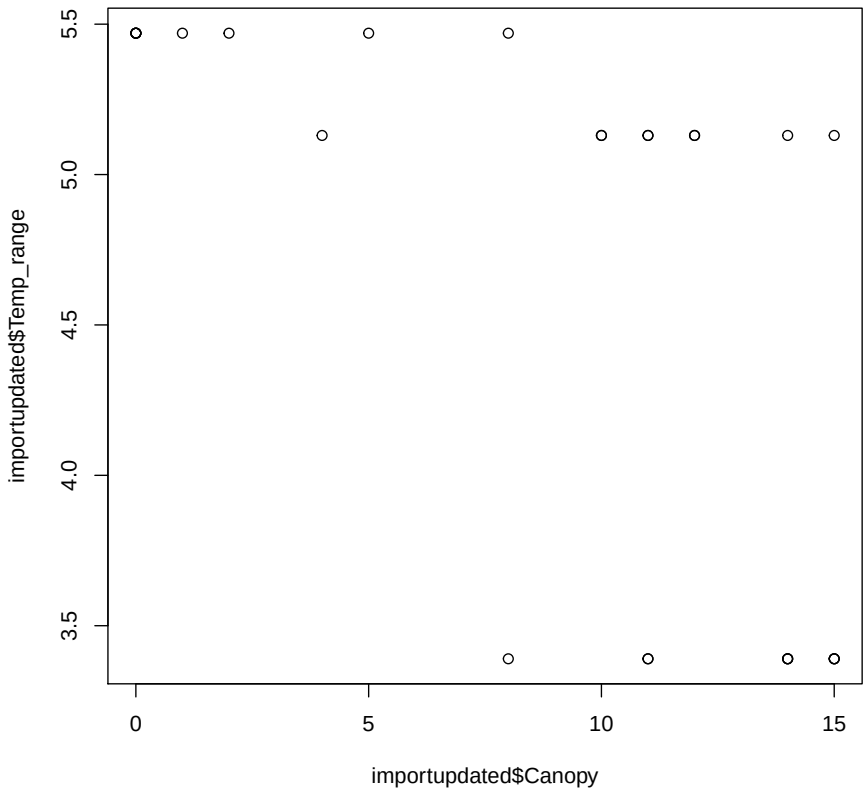



```
plot(importupdated$Canopy,importupdated$Algae)
```



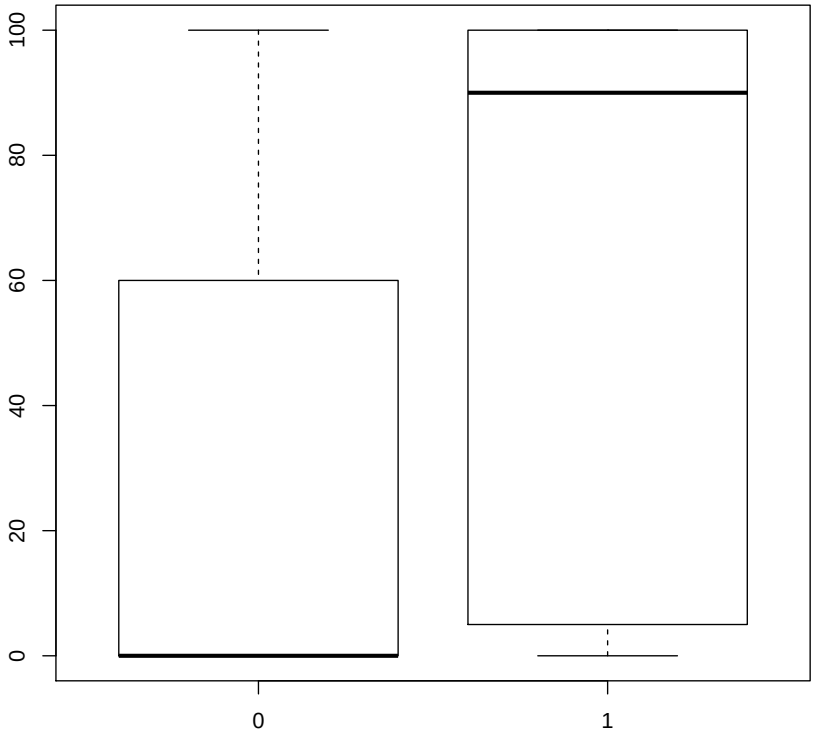
Cannot reject null hypothesis.

```
plot(importupdated$Canopy,importupdated$Temp_range)
```



Our temperature data was too coarse to really be useful. Will eventually redo with other temp data, perhaps testing variance of temp by site rather than raw temp data.

```
boxplot(Algae~Sediment,importupdated)
```



Our Pr(¿F)=0.0643 which means we cannot reject null hypothesis, but only barely. This indicates that there is probably some relationship between algae cover and sediment composition of the stream bed, and this should be examined in future.