

# 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/fc102013/Santa-Ana-Sucker-Recovery/Data/Data_TUES_1/updatedtemps  
importupdated=read.csv(updateddata)
```

## 1.2 Summary Statistics

The following code was used to generate summary statistics.

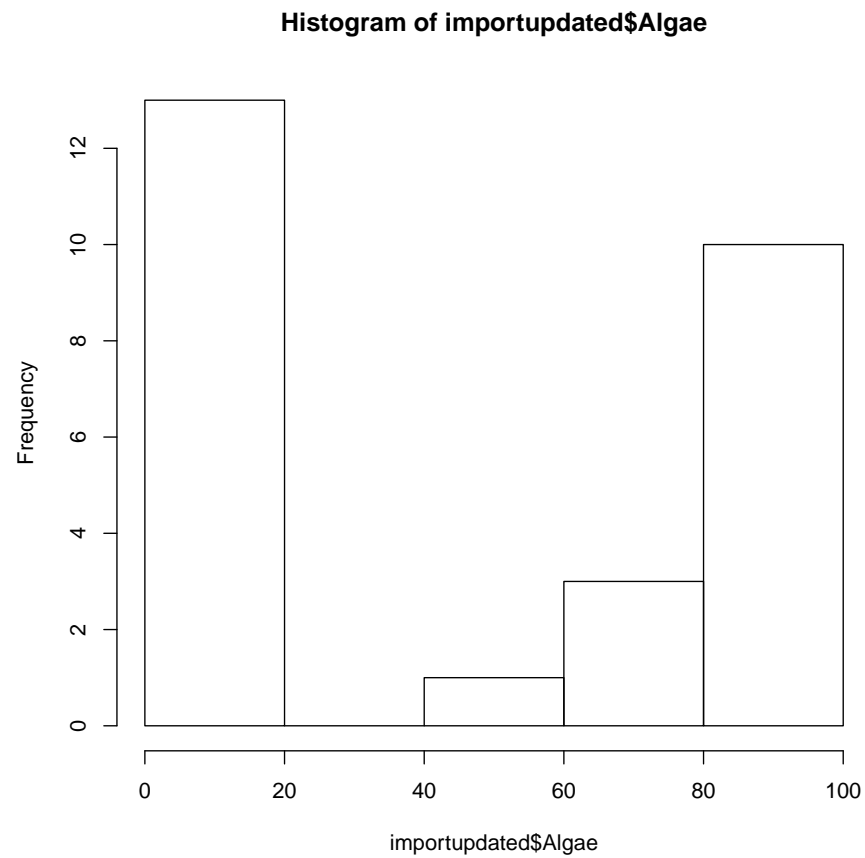
```
summary(importupdated)
```

##	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		

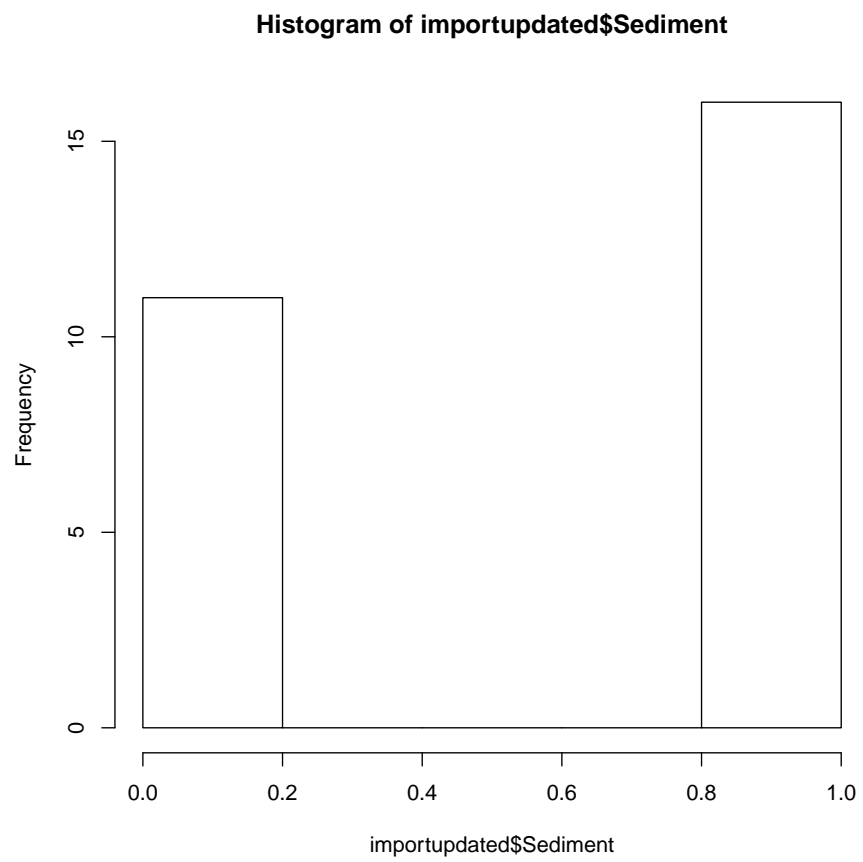
### 1.3 Distribution

Write some stuff about the summary here...

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

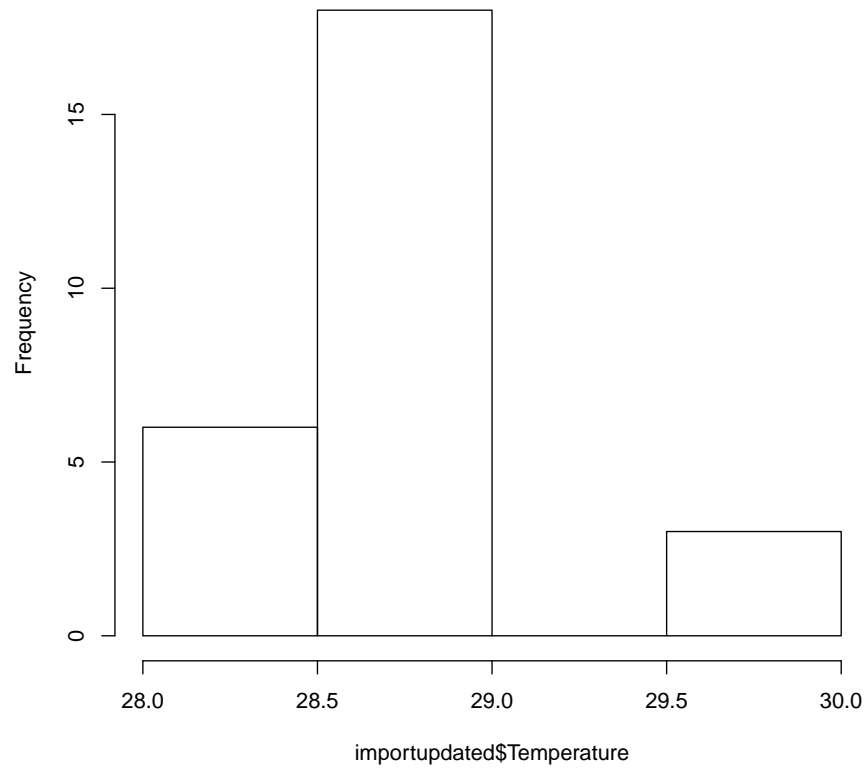


```
hist(importupdated$Sediment)
```



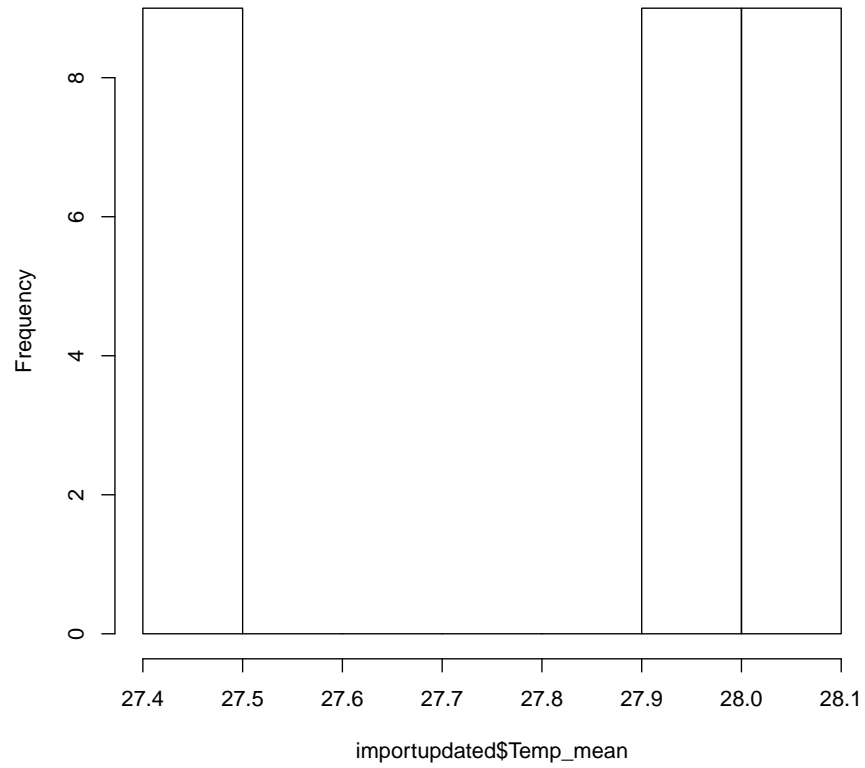
```
hist(importupdated$Temperature)
```

**Histogram of importupdated\$Temperature**



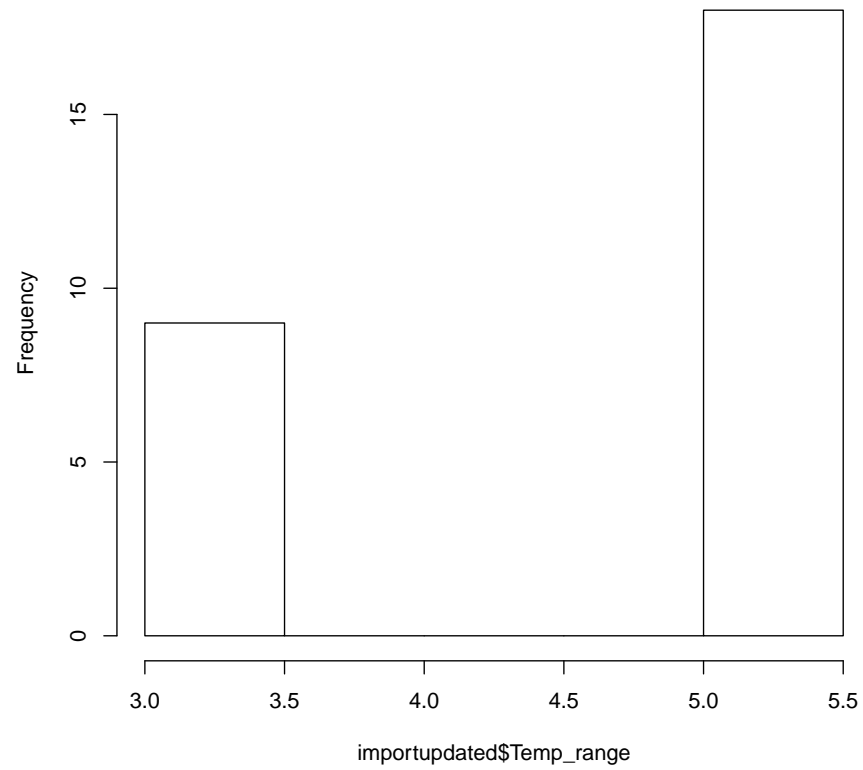
```
hist(importupdated$Temp_mean)
```

Histogram of importupdated\$Temp\_mean

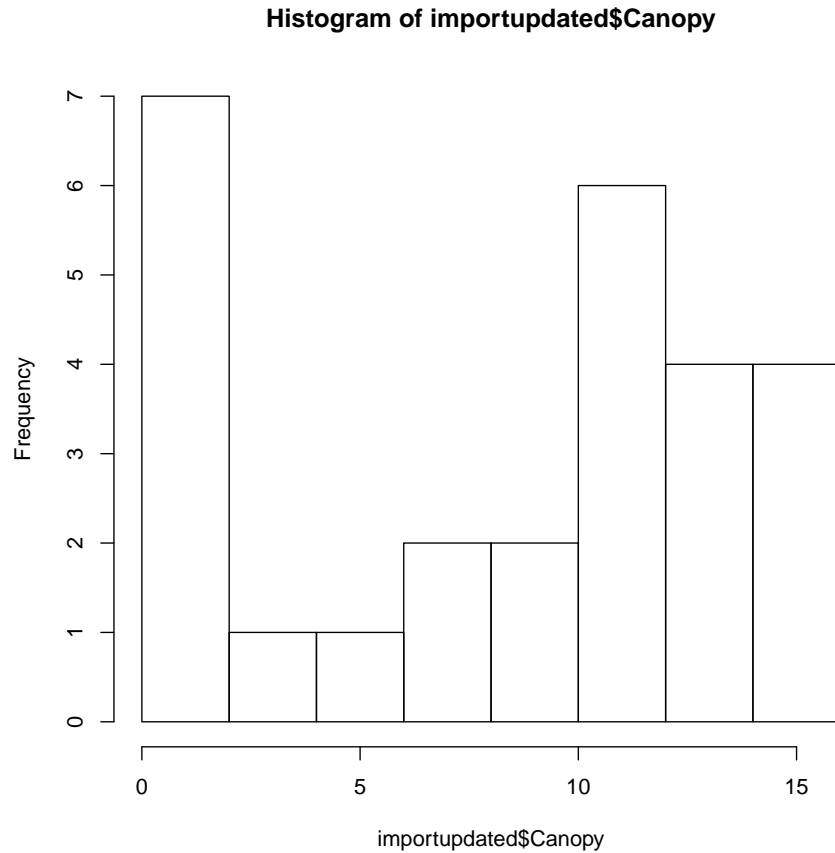


```
hist(importupdated$Temp_range)
```

Histogram of importupdated\$Temp\_range



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



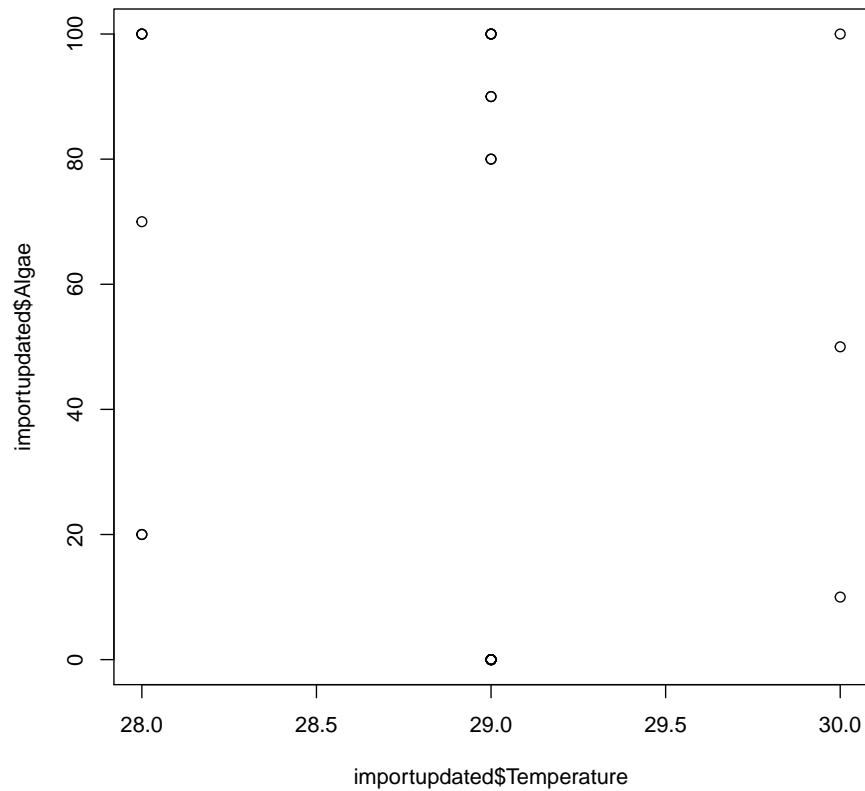
## 2 Bias and Data Limitations

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 adversely impacting algae populations to an unknown degree. Therefore our measurements likely reflect less-than-typical algae abundance. Our measurements were taken by undergraduate students without extensive algae fieldwork experience or training.

## 3 Results

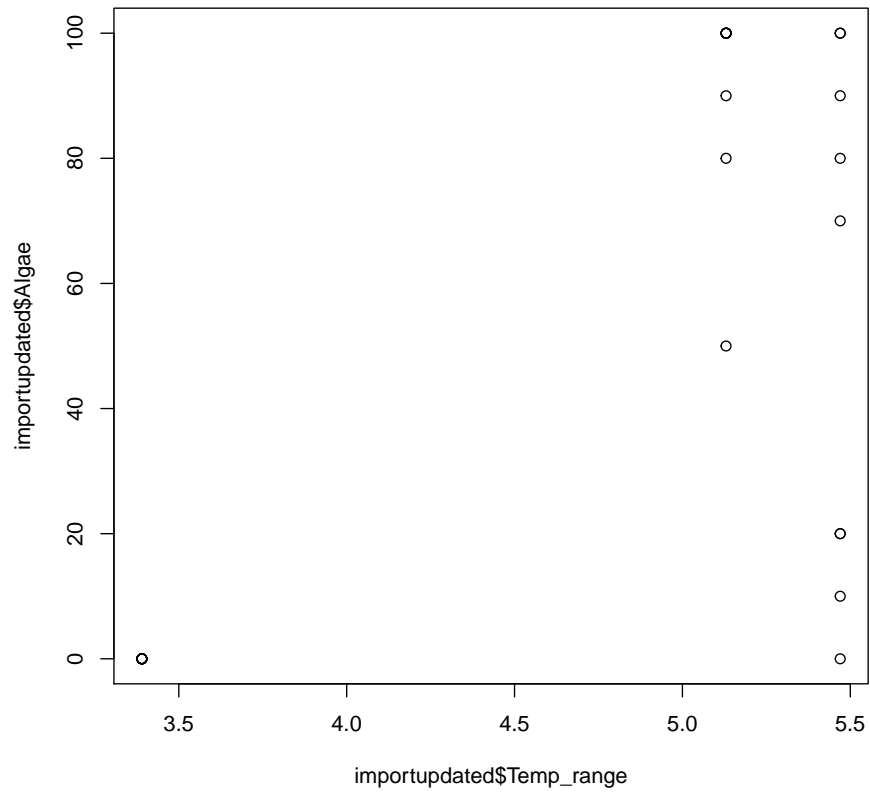
```
plot(importupdated$Temperature,importupdated$Algae)
```



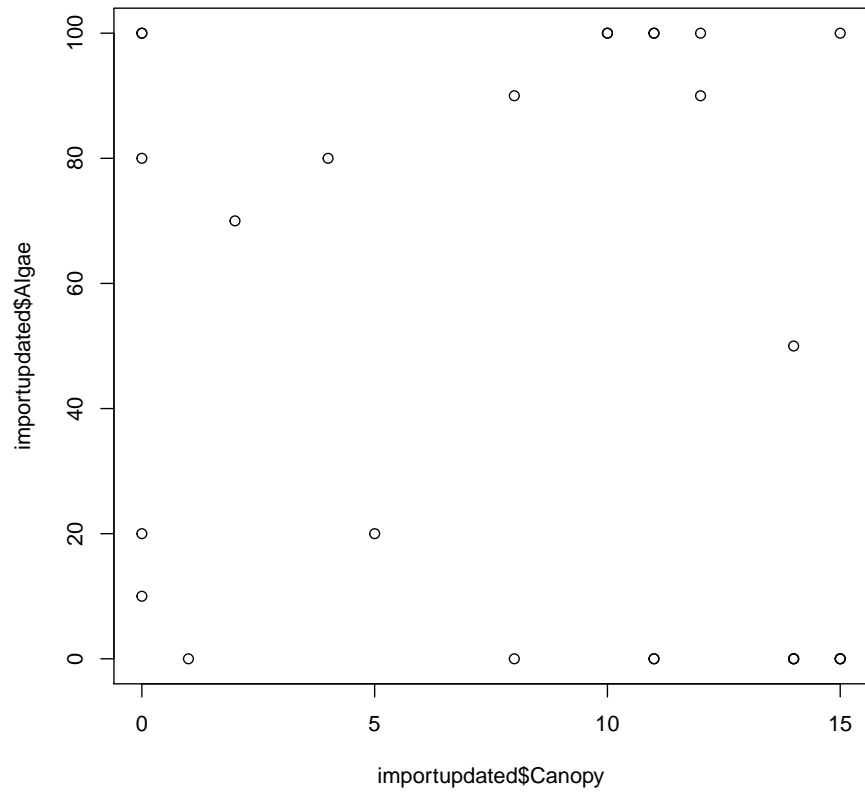
Our temperature data was too coarse to really be useful. So instead we proceeded to use WED1 team's temperature data. The following is a plot of algae abundance as a function the range of temperature.

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



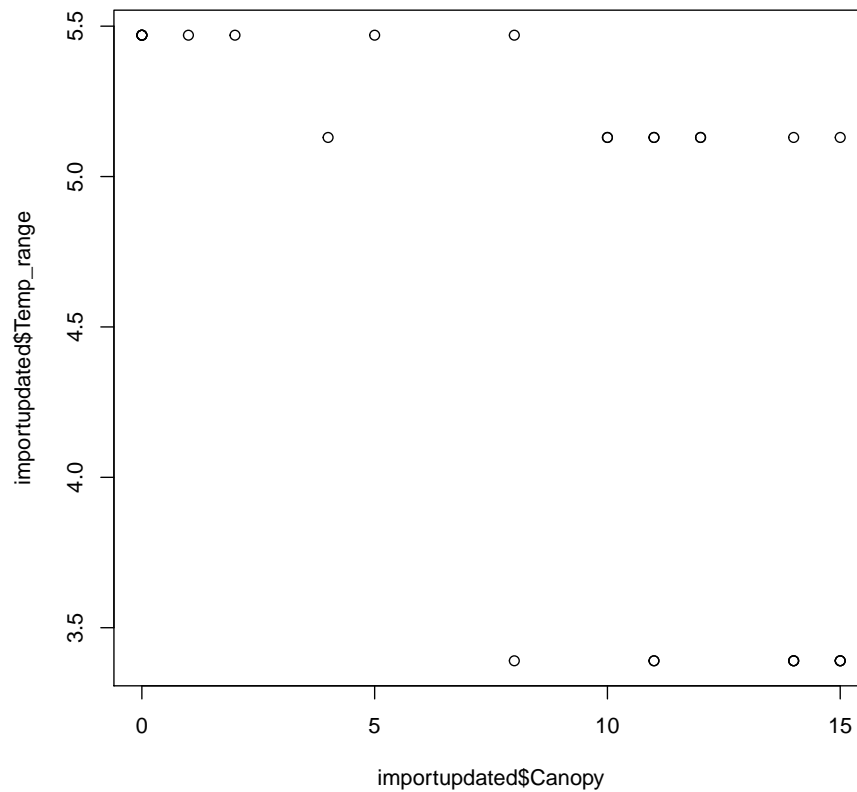


```
plot(importupdated$Canopy,importupdated$Algae)
```



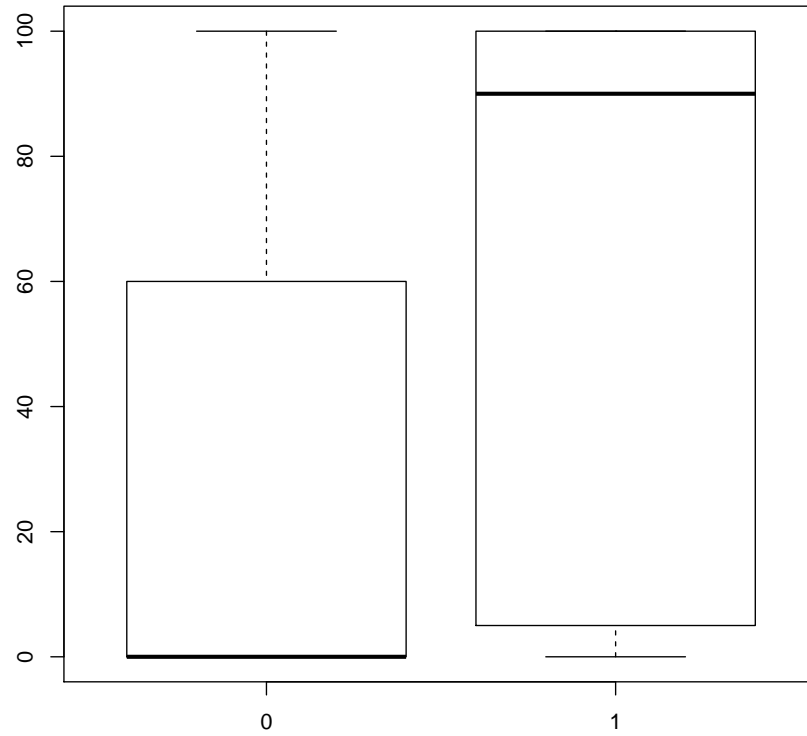
Cannot reject null hypothesis.

```
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  $\Pr(\hat{z}|F)=0.0643$  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.