1 Data Description

This data was collected in the Rialto portion of the Santa Ana river over a period of eleven nights for the sites 1, 3, and 4, and seven nights for site 2. Site 4 was the plunge pool, located the furthest downstream. Site 3 was where the Rix influx was. Site 2 was upstream below the concrete channel and Site 1 was in the concrete Rialto channel. The pendant data logger collected data in degrees Celsius every fifteen minutes from 9/24/16 through 10/05/16, and until 10/1/16 for site 2.

1.1 Importing Data

```
> file4 = "/home/CAMPUS/smjx2015/Santa Ana Sucker/Data/Data_Weds_1/Plunge_Pool clipped.csv"
> site4 <- read.csv(file4)
> file3 = "/home/CAMPUS/smjx2015/Santa Ana Sucker/Data/Data_Weds_1/2nd_Site clipped.csv"
> site3 <- read.csv(file3)
> file2 = "/home/CAMPUS/smjx2015/Santa Ana Sucker/Data/Data_Weds_1/3rd_Site clipped.csv"
> site2 <- read.csv(file2)
> file1 = "/home/CAMPUS/smjx2015/Santa Ana Sucker/Data/Data_Weds_1/Concrete clipped.csv"
> site1 <- read.csv(file1)
>
```

1.2 Summary Statistics

The mean temperatures at Locations 1-4 were all relatively similar, however the range in maximum and minimum tempratures seemed to vary. The locations closer to the Rialto channel had the most range in temperature, ranging up to 5.41 degrees difference, whereas as the water travelled downstream to the plunge pool and lower regions, the variation in temperature was reduced. Therefore, the plunge pool, Site 4, had the least temperature variation of 1.59 degrees Celsius.

```
> summary(site1)
```

```
       ID                  DateTime         Temp
 Min.   :   3.0   10/1/2016 0:02:   1   Min.   :25.90
 1st Qu.: 262.2   10/1/2016 0:17:   1   1st Qu.:27.37
 Median : 521.5   10/1/2016 0:32:   1   Median :27.91
 Mean   : 521.5   10/1/2016 0:47:   1   Mean   :28.03
 3rd Qu.: 780.8   10/1/2016 1:02:   1   3rd Qu.:28.66
 Max.   :1040.0   10/1/2016 1:17:   1   Max.   :31.37
                  (Other)       :1032
```

```
> summary(site2)
```

```
       ID                  DateTime        Temp
 Min.   :  4.0   10/1/2016 0:03:  1   Min.   :25.12
```

```
 1st Qu.:176.2   10/1/2016 0:18:  1   1st Qu.:26.68
 Median :348.5   10/1/2016 0:33:  1   Median :27.37
 Mean   :348.5   10/1/2016 0:48:  1   Mean   :27.46
 3rd Qu.:520.8   10/1/2016 1:03:  1   3rd Qu.:28.16
 Max.   :693.0   10/1/2016 1:18:  1   Max.   :30.25
                 (Other)       :684
```

```
> summary(site3)
```

```
       ID                  DateTime         Temp
 Min.   :   4.0   10/1/2016 0:00:   1   Min.   :27.37
 1st Qu.: 263.8   10/1/2016 0:15:   1   1st Qu.:27.66
 Median : 523.5   10/1/2016 0:30:   1   Median :27.86
 Mean   : 523.5   10/1/2016 0:45:   1   Mean   :27.94
 3rd Qu.: 783.2   10/1/2016 1:00:   1   3rd Qu.:28.06
 Max.   :1043.0   10/1/2016 1:15:   1   Max.   :30.76
                  (Other)       :1034
```

```
> summary(site4)
```

```
       ID                  DateTime         Temp
 Min.   :   3.0   10/1/2016 0:14:   1   Min.   :27.07
 1st Qu.: 262.8   10/1/2016 0:29:   1   1st Qu.:27.47
 Median : 522.5   10/1/2016 0:44:   1   Median :27.66
 Mean   : 522.5   10/1/2016 0:59:   1   Mean   :27.74
 3rd Qu.: 782.2   10/1/2016 1:14:   1   3rd Qu.:27.96
 Max.   :1042.0   10/1/2016 1:29:   1   Max.   :28.66
                  (Other)       :1034
```

1.3 Distribution

Write some stuff about the summary here...

```
> hist(site1$Temp)
```

```
> hist(site2$Temp)
```

```
> hist(site3$Temp)
```

```
> hist(site4$Temp)
```

```
> boxplot(site4$Temp)
> boxplot(list(site1$Temp, site2$Temp, site3$Temp, site4$Temp), las=1, ylab="Temperature (C)
```

2 Bias and Data Limitations

Site 2 was removed four days prior to the removal of sites 1, 3, and 4. The probes also may vary in their accuracy and calibration, which will be tested for via an ice bath test.