

How has Climate Change Impacted Washington D.C.?

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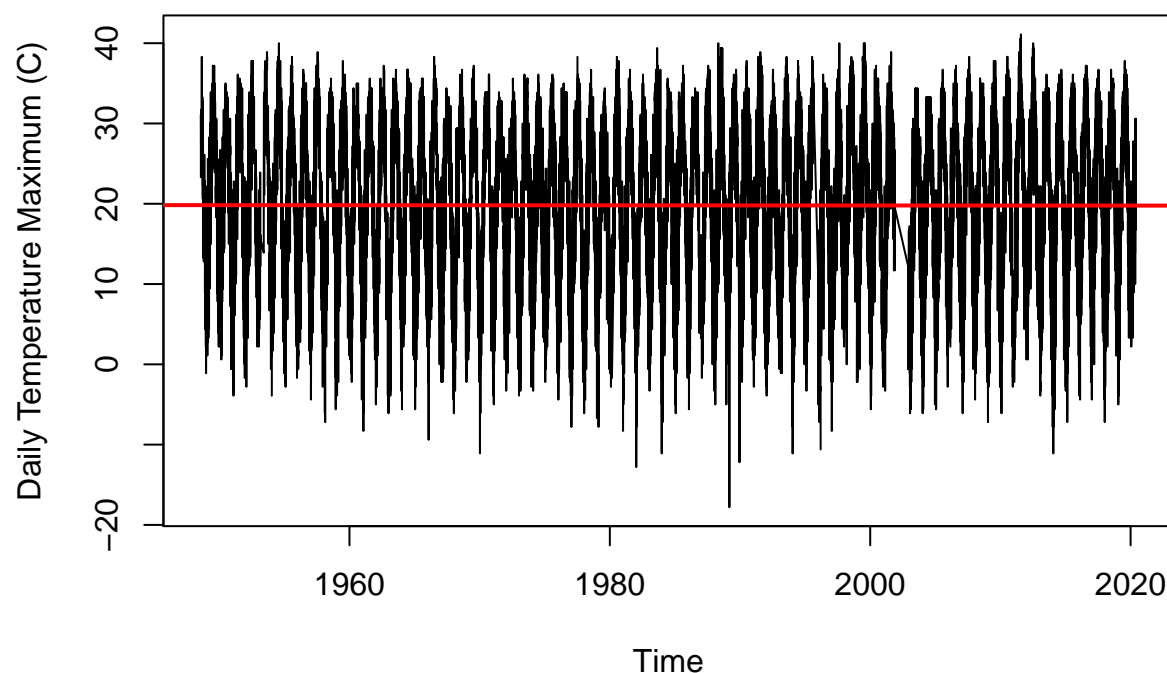
Figure 1: View of Tidal Basin flooded in 2018

TMAX Has No Significant Change

Even though the slope on the temperature maximum graph is actually decreasing (meaning DC has gotten cooler), this correlation only has a p- value of .7895 which means that it is not significant. Monthly analysis also reveal that no months have changes in temperature maximums.

```
##      (Intercept)      NewDate
## 1.981160e+01 -2.269816e-06
```

Washington D.C. Daily Temperature Maximum vs Time

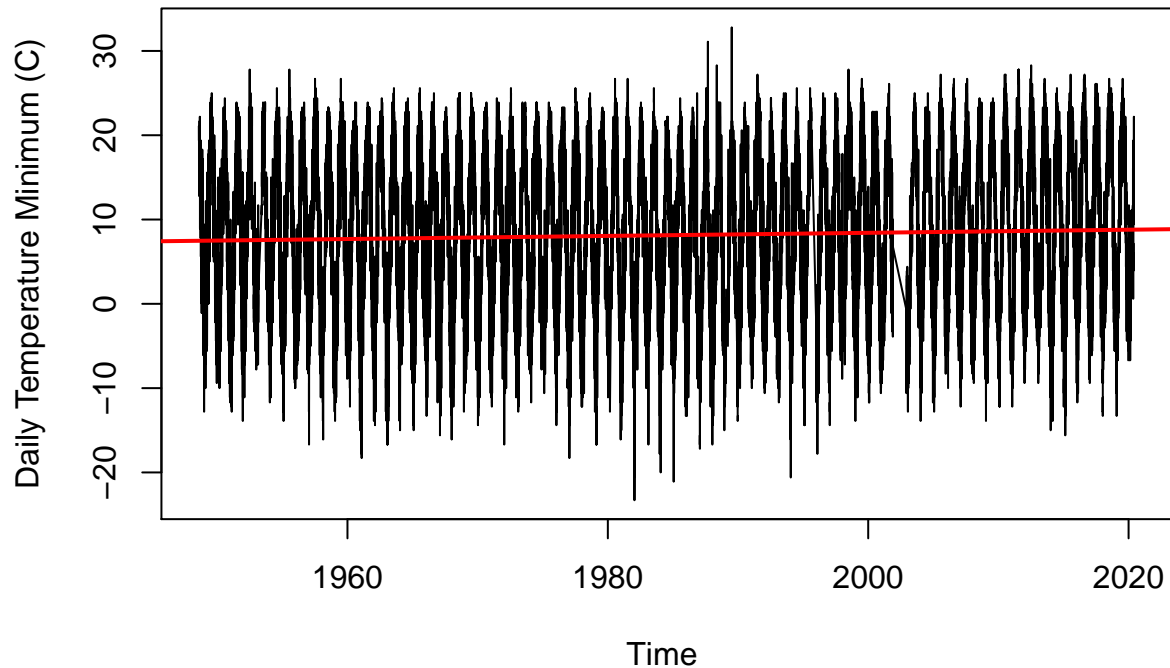


```
##
## Call:
## lm(formula = TMAX ~ NewDate, data = climate_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -37.596  -8.118   1.277   9.086  21.323
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  1.981e+01  7.793e-02 254.226  <2e-16 ***
## NewDate      -2.270e-06  8.501e-06  -0.267   0.789
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 10.19 on 25133 degrees of freedom
## (333 observations deleted due to missingness)
## Multiple R-squared:  2.836e-06, Adjusted R-squared:  -3.695e-05
## F-statistic: 0.07129 on 1 and 25133 DF, p-value: 0.7895
```

TMIN Temperatures Have Increased

While there is not a significant temperature maximum change, there is a very significant p value of 1.23×10^{-10} for daily temperature minimums since 1950. The positive slope on this graph indicates that in DC daily temperature minimums have gotten warmer.

Washington D.C. Daily Temperature Minimum vs Time



```
##
## Call:
## lm(formula = TMIN ~ NewDate, data = climate_data)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -31.3958  -7.5483  -0.1145   8.3228  24.5669
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept)  7.874e+00  7.170e-02 109.821  < 2e-16 ***
## NewDate      5.032e-05  7.816e-06   6.439 1.23e-10 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 9.359 on 25085 degrees of freedom
## (381 observations deleted due to missingness)
## Multiple R-squared:  0.00165,    Adjusted R-squared:  0.00161
## F-statistic: 41.46 on 1 and 25085 DF,  p-value: 1.227e-10
```

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.