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This research aimed to look at extreme heat days and how they have changed overtime. To deepen our understanding of the interaction between the urban heat island and global warming, the change in extreme heat days was studied. By plotting temperature data of Ardsley and Times Square, one could understand temperature differences between urban and suburban areas in close proximity to one another.

By using a linear regression model as a predictive method for future temperatures, we are able to predict what temperatures will look like in 2050. Though some of these graphs may prove to be statistically significant, others may be statistically weak. These calculations were also made using the safe assumption that gas emissions will be emitted like they have been for the past few decades. When predicting the possible trends for average daily maximum temperatures, though the trend using data from the years after 1980 is statistically weak, this is due to the fact that a smaller sample size was used. If temperature data from the next few decades were used and we reassessed what this trend would look like, it may be more likely to be a statistically significant trend.

One of the main findings from this research was that if warming trends continue at their current rate by 2050, we will see an increase in the summer daily maximum temperatures. When using trend data from 1950 to 2016, the linear regression model predicts the average daily maximum temperature in Times Square will be 29.4 degrees Celsius. When using Times Square temperature data from 1980 to 2016, the predictor predicts it will be 30.1 degrees Celsius. If the average maximum temperature for the year 2050 is 29.3, the predictor predicts that there will be about 22.6 extreme heat days, but if the average daily maximum temperature for the summer in Times Square is 30.1 in 2050, there will be about 28.5 extreme heat days. These heat days are days that fall above the 90th percentile of temperatures in their respective locations.

In Ardsley, the linear regression model predicts that the summer daily maximum temperature will be 28.8 degrees when using data from the years 1950 to 2016, but when using data from 1980 to 2016, it predicts 29.4 degrees. Either of these trends are likely trends to follow, but since the years after 1980 show a rapid increase in warming trends, it is more probable that warming trends will follow a warming trend closer to the trend using data after 1980. If the average daily maximum temperature for 2050 in Ardsley is 28.8 degrees, there will be an estimated 23.0 heat days for Ardsley, but if that temperature is 29.4 there will be 18 days.

The small increase in average summer temperatures meant a large increase in heat days. When comparing the number of extreme heat days in Ardsley to temperatures in Times Square, it is evident that the number of heat days above their respective 90th percentile thresholds is increasing at a faster rate than the rate at which the frequency of Ardsley’s extreme heat events is increasing.

This research gives an overview of the effect that global warming has on temperatures from 1950 to 2016 and also can assist in our understanding of the urban heat island when urban temperature data is compared to a suburban area’s temperatures. This research confirms that the urban heat island is a driver of warmer temperatures in comparison to the surrounding areas. Since warming trends are increasing at a faster rate, heat related mortality is only expected to increase. Heat related mortality is also an issue that targets mainly people over the age of 65 and research only shows that this population is only increasing overtime. This poses a large health hazard for urban low-income residents because they are less likely to have access to adequate air conditioning and live in dense areas (Sheridan 2007). This population is growing rapidly and the number of people over the age of 65. These statistics are proof that there is a need for heat mitigation strategies and the implementation of emergency response plans in the case of a heat related emergency.