

# Climate Trend Analysis: Is Florida Getting Warmer?

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## 1 Introduction

This report examines historical temperature data to answer the question: is Florida warming? By analyzing the temperature trends in Key West, Florida, I conclude that there is an upward trend in temperatures over the 20th century.

## 2 Methods

I conducted a permutation analysis to calculate the correlation coefficient between time and temperature, accounting for the serial dependence in the time-series data. This method shuffles the temperature data points and recalculates the correlation coefficient 1000 times to create a distribution of correlation coefficients under the null hypothesis of no relationship between time and temperature.

## 3 Visualization

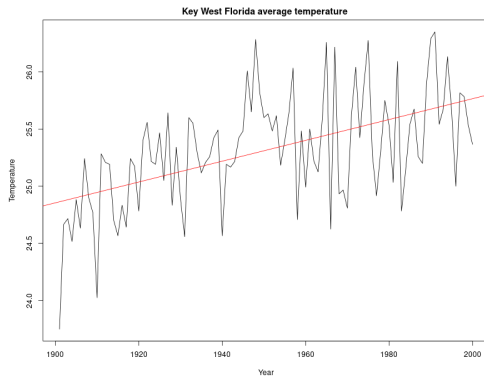


Figure 1: This can be learned by looking at the trend line added to the graph. The trend in average annual temperatures for Key West shows a significant increase in average annual temperatures since the 20th century, showing that Key West's climate is warming.

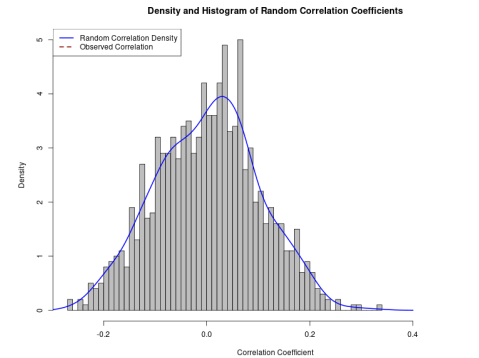


Figure 2: It is clear from the histogram that the random correlation coefficient is much smaller than the observed correlation coefficient, so it can be concluded that the value of p value is very small

## 4 Conclusion

The statistical analysis clearly indicates that Florida is experiencing a warming trend. The observed correlation coefficient significantly exceeds the distribution of coefficients under the null hypothesis, with a p-value less than 0.0001. This analysis confirms that the temperatures in Key West have risen significantly over the past century.