Devin Delfino
PHYS 228: Scientific Computing
Assignment 1: Looking for Climate Change, Part 2

1. The following chart plots the temperature anomalies as a function of time.

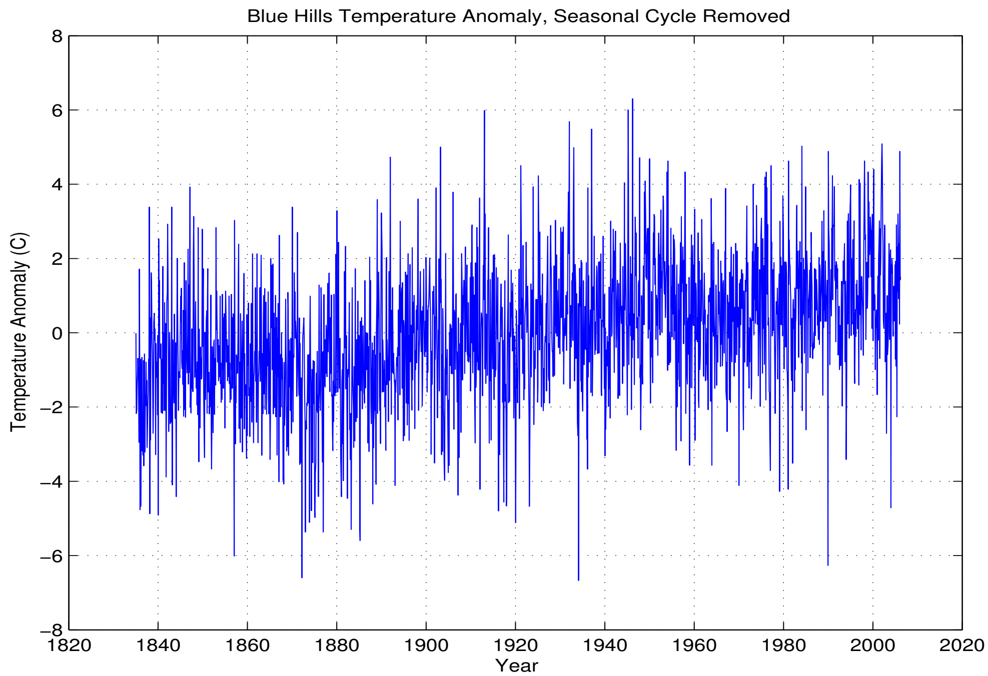

Figure 1: Temperatures recorded at Blue Hills, 1835-2006

2. The following charts plot the 10-year, 5-year, and 1-year moving averages of the monthly temperature anomaly data. The smaller the moving average window, the more the plot will fluctuate because the mean will be contrived of less data and therefore less accurate.

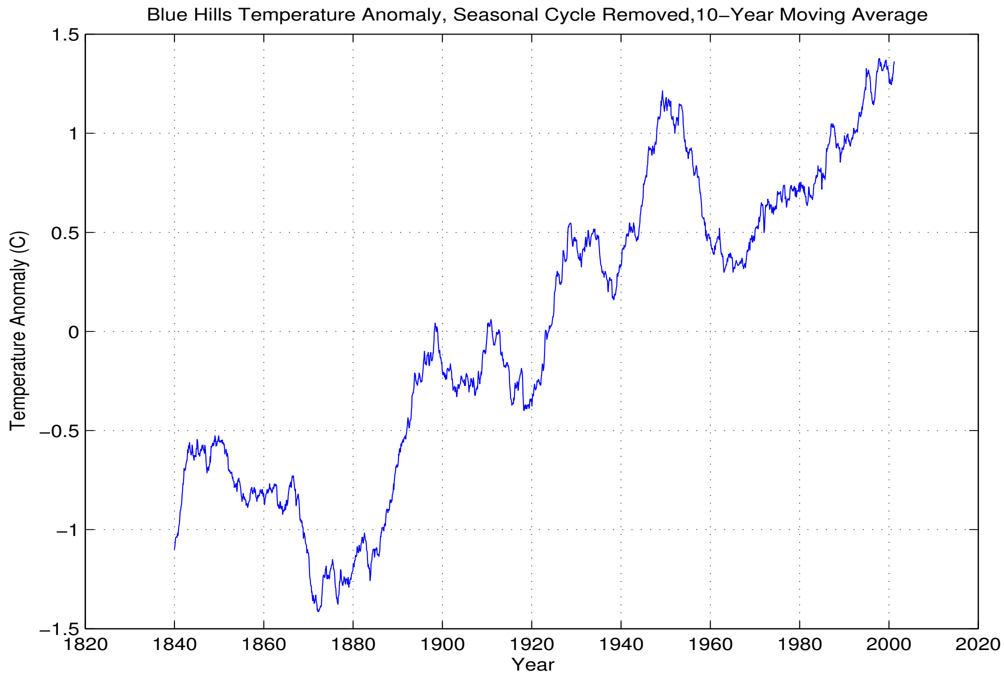

Figure 2: 10-year moving average

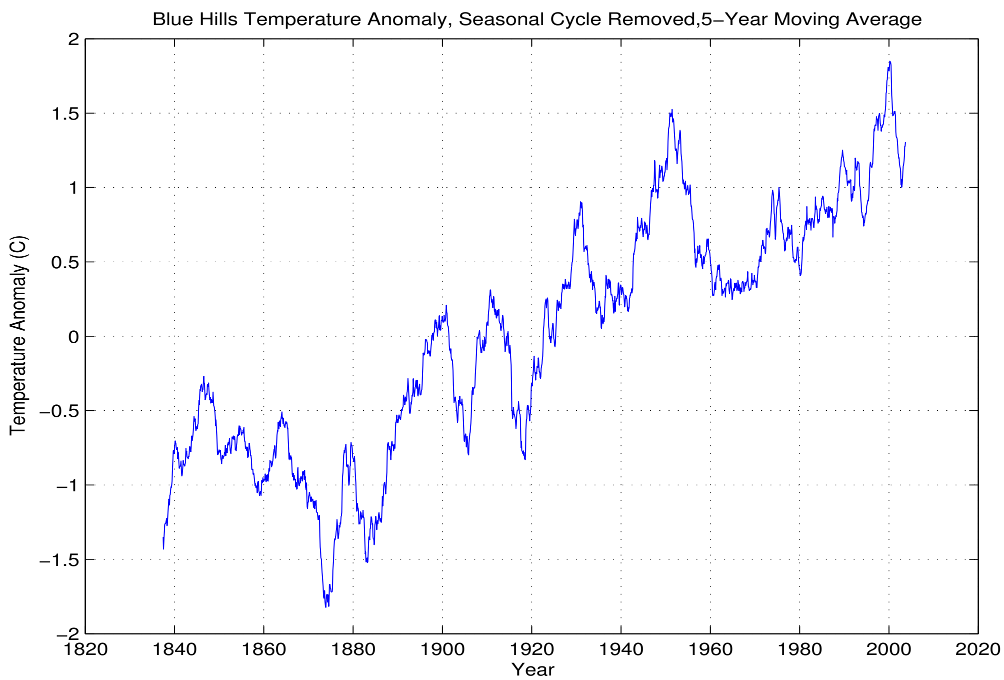

Figure 3: 5-year moving average

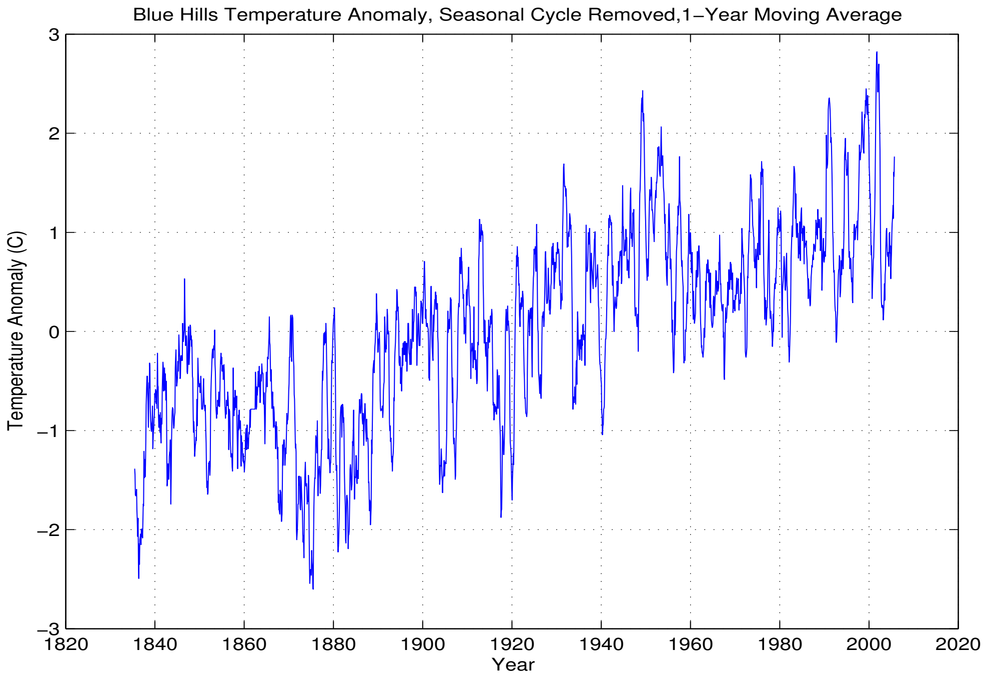

Figure 4: 1-year moving average

3. Looking at the plot for the 100-year moving average for the monthly temperature anomaly in Blue Hills, the plot is nearly linear. From 1900 to 1950, the temperature anomaly increased by about $4°C$ (from $-3.5°C$ to $0.5°C$). So the slope for this linear plot is $4/50$ or 0.08. The temperatures in the Blue Hills are increasing at a rate of $0.08°C$ per year and about $8°C$ per Century.

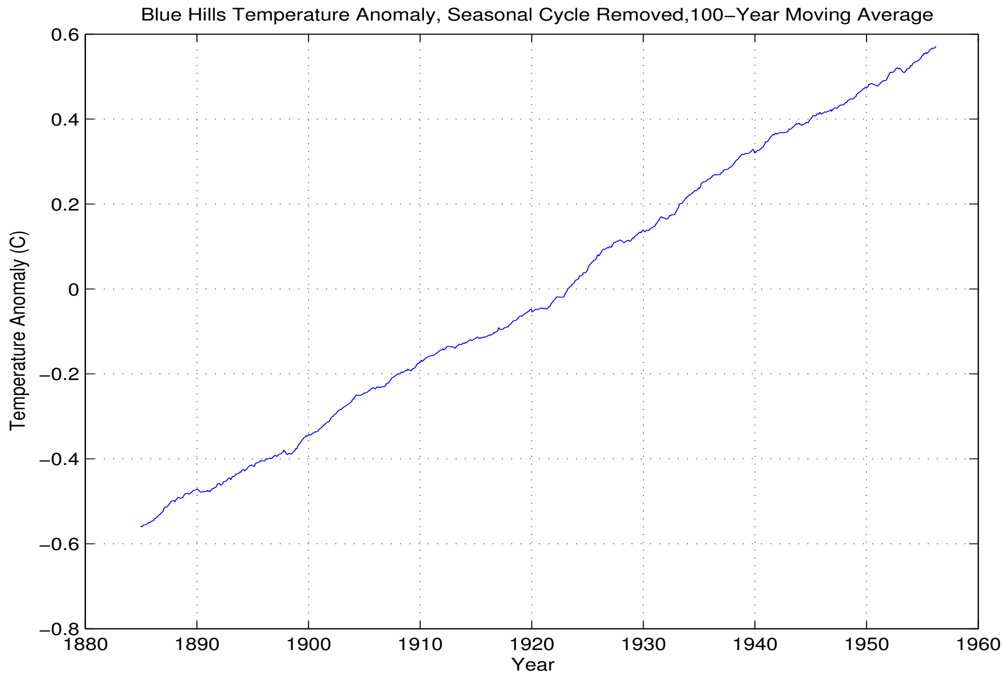

Figure 5: 100-year moving average

4. The following charts plot various moving averages for monthly temperature anomalies in Buenos Aires, Melbourne, and Tokyo.

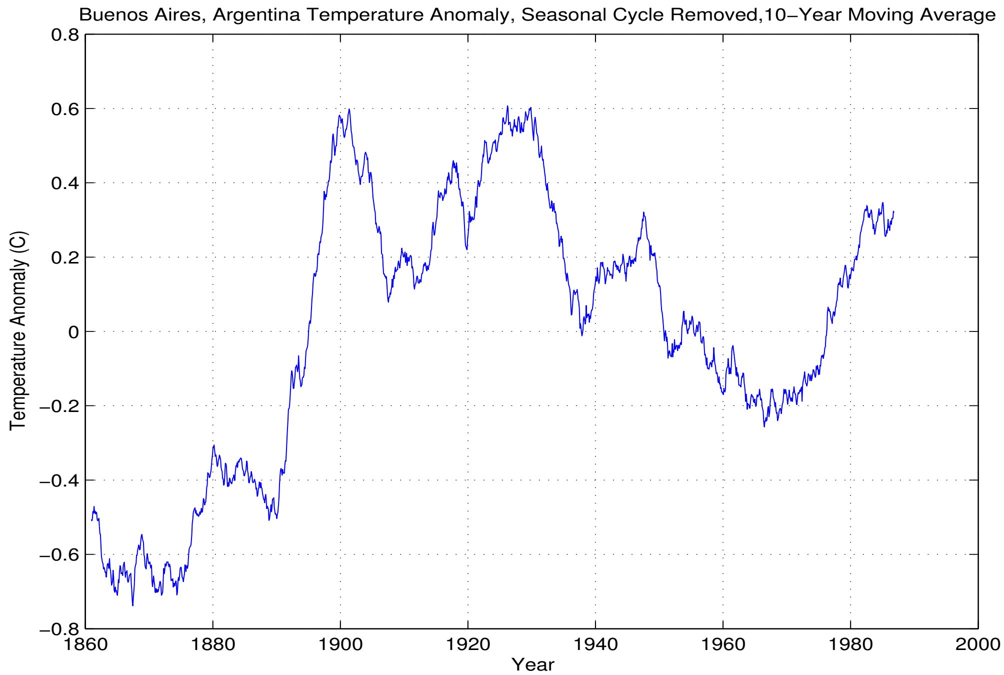

Figure 6: 10-year moving average of temperature anomalies in Buenos Aires, Argentina

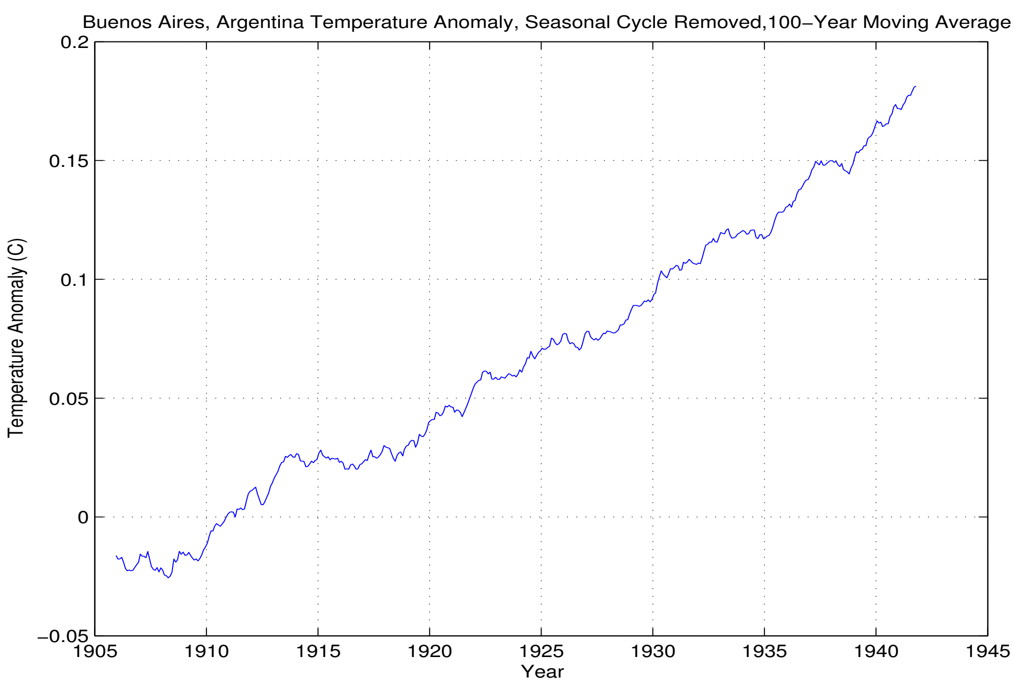

Figure 7: 100-year moving average of temperature anomalies in Buenos Aires, Argentina

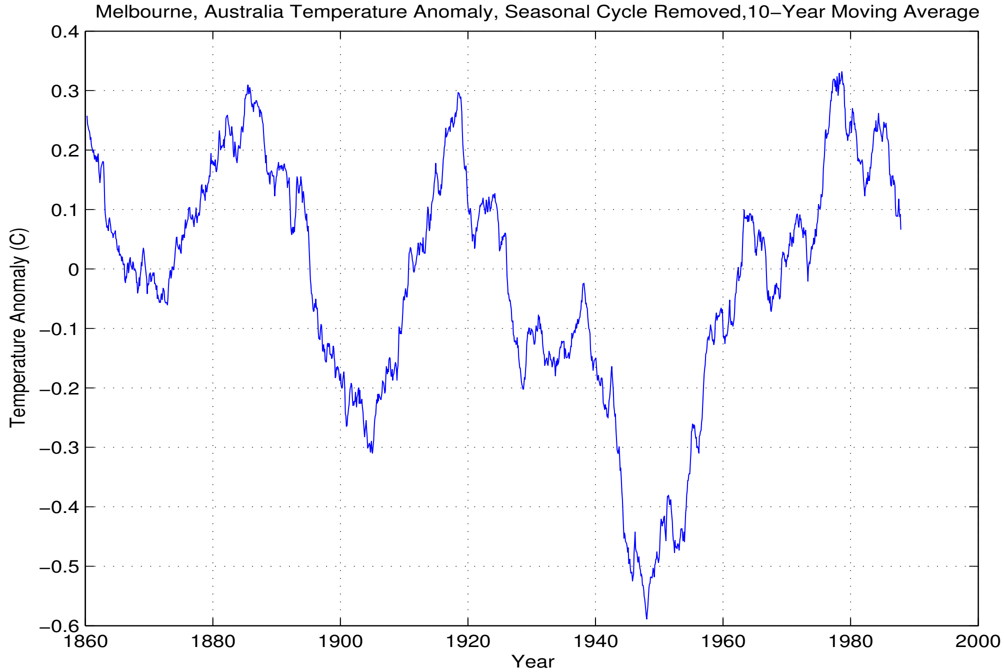

Figure 8: 10-year moving average of temperature anomalies in Melbourne, Australia

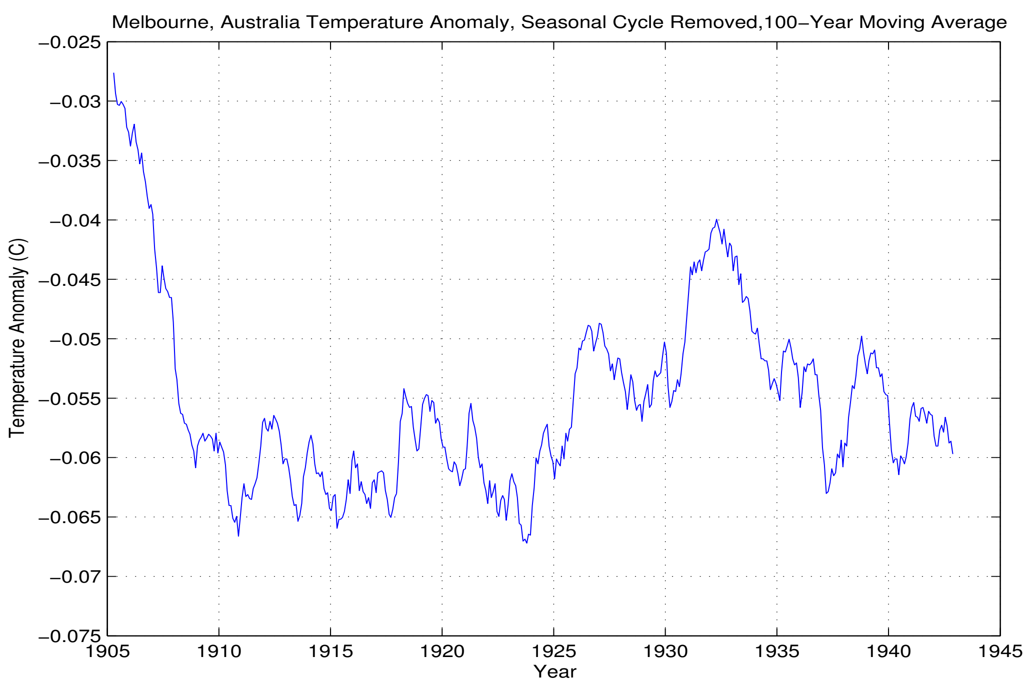

Figure 9: 100-year moving average of temperature anomalies in Melbourne, Australia

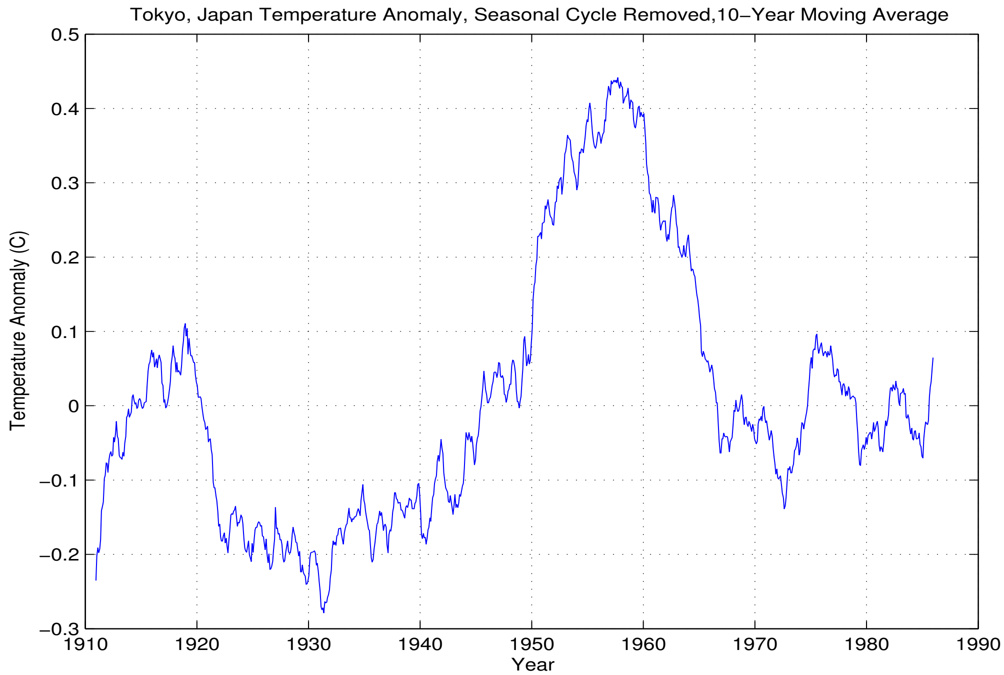

Figure 10: 10-year moving average of temperature anomalies in Tokyo, Japan

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I have abided by the Wheaton Honor Code in this work.