

Exploring Weather Trends

In this project, I analyzed local and global temperature data and compared the temperature trends where I live to overall global temperature trends. I did this by creating a visualization and preparing a write up describing the similarities and differences between global temperature trends and temperature trends in Columbus, Ohio.

The Database Schema

There are three tables in the database:

- city_list - This contains a list of cities and countries in the database. Look through them in order to find the city nearest to you.
- city_data - This contains the average temperatures for each city by year (°C).
- global_data - This contains the average global temperatures by year (°C).

I will first do a SQL query to see all the cities listed in the United States in the city_list table.

```
SELECT *
```

```
FROM city_list
```

```
WHERE country = 'United States';
```

From the city_list Columbus is the closest major city so I queried the city_data for Columbus. I then exported to Google Spreadsheet.

```
SELECT *
```

```
FROM city_data
```

```
WHERE city = 'Columbus';
```

I also queried the global_data and exported the table to Google Spreadsheet.

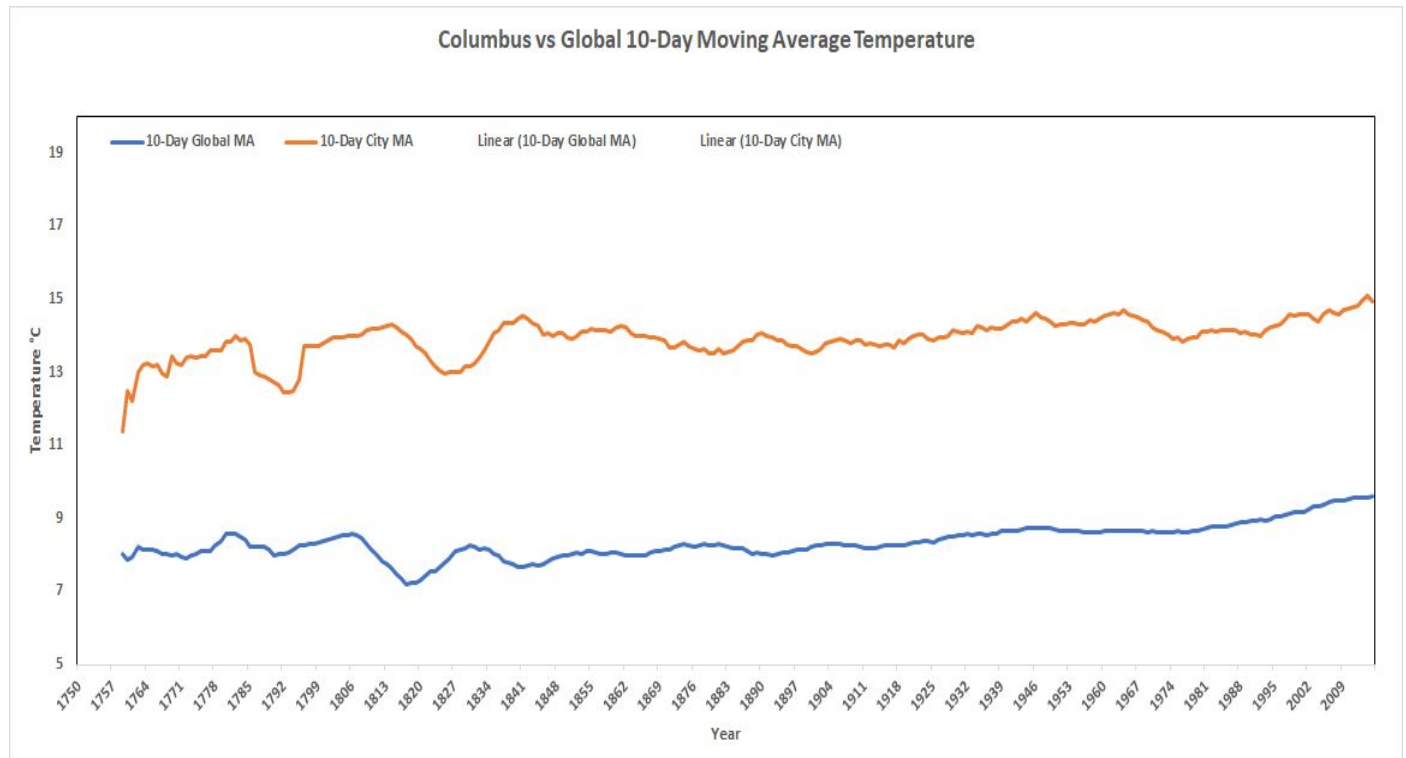
```
SELECT *
```

```
FROM global_data;
```

Now that I have extracted the data from the database, we can now calculate the moving average in order to better visualize the data and observe the long term trends. I created a new column called 10-day MA for each set of datas, which is where the moving average field will be stored. I went down to the 11th row in each data set (year 1752) and used the AVERAGE() function to calculate the average temperature for the first 10 years. I clicked and dragged the formula down to the next cell and to the end of the datasets in order to calculate the moving averages for all the other years up to 2013.

fx	10-Day City MA				
	A	B	C	D	E
1	year	city	country	avg_temp	10-Day City MA
2	1743	Columbus	United States	7.46	
3	1744	Columbus	United States	15.73	
4	1745	Columbus	United States	6.91	
5	1746	Columbus	United States		
6	1747	Columbus	United States		
7	1748	Columbus	United States		
8	1749	Columbus	United States		
9	1750	Columbus	United States	14.62	
10	1751	Columbus	United States	15.36	
11	1752	Columbus	United States	8.3	11.39666667
12	1753	Columbus	United States	14	12.48666667
13	1754	Columbus	United States	14.11	12.21666667
14	1755	Columbus	United States	11.66	13.00833333
15	1756	Columbus	United States	14.24	13.18428571
16	1757	Columbus	United States	13.62	13.23875

fx	A	B	C
1	year	avg_temp	10-Day Global MA
2	1750	8.72	
3	1751	7.98	
4	1752	5.78	
5	1753	8.39	
6	1754	8.47	
7	1755	8.36	
8	1756	8.85	
9	1757	9.02	
10	1758	6.74	
11	1759	7.99	8.03
12	1760	7.19	7.877
13	1761	8.77	7.956
14	1762	8.61	8.239
15	1763	7.5	8.15
16	1764	8.4	8.143

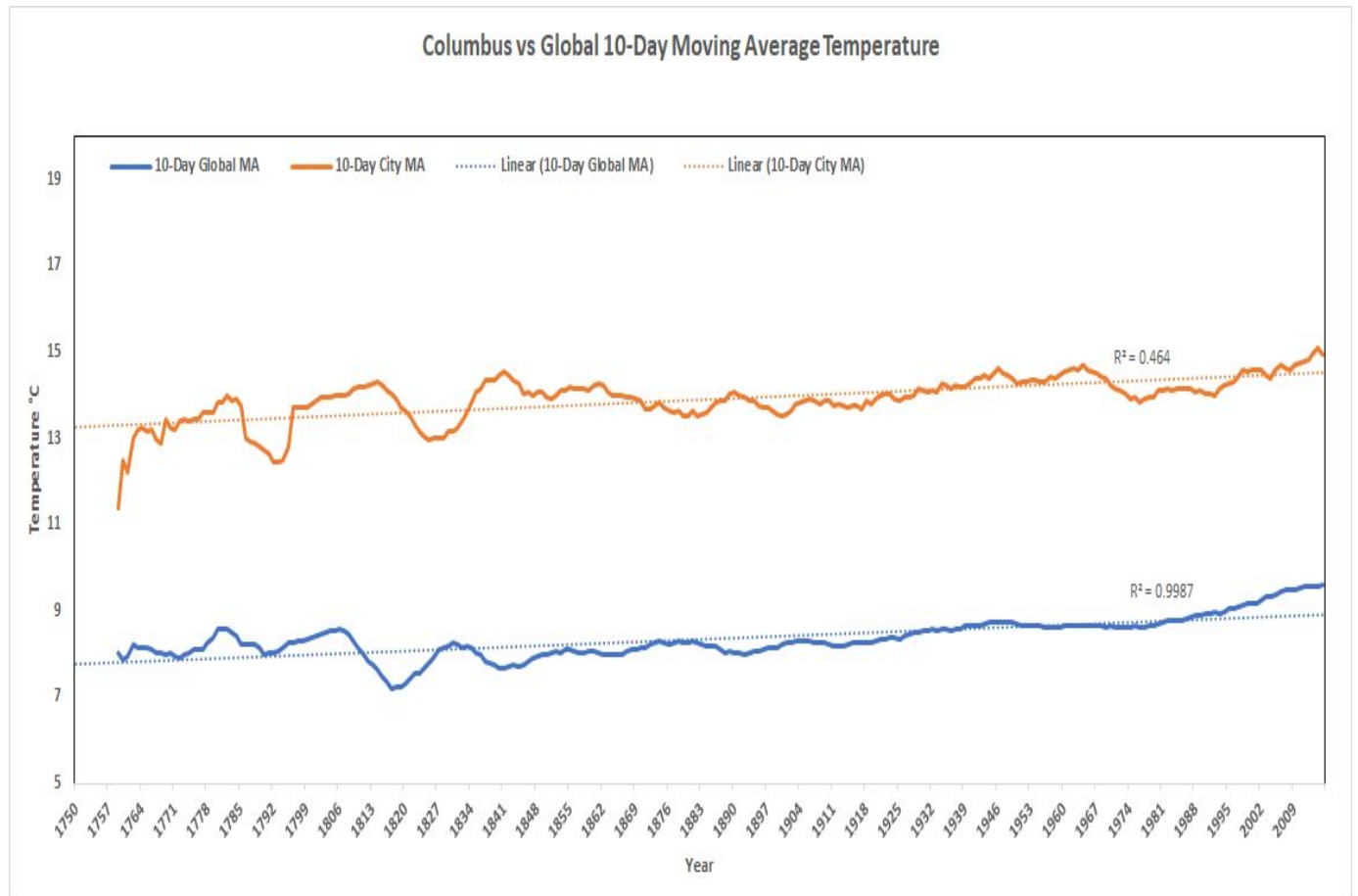


Over the past 250 years there is no significant warming trend when comparing both datasets of City versus Global temperatures. Global and city temperature increase at a similar rate.

However, Columbus has been warmer over that 250 year period by approximately 6 degrees.

Between 1780 and 1800 even when the city average dropped by a few degrees, it still remained higher than the global average.

From 1746 to 1749 there was missing data for the city. It is assumed that those years had an average temperature close to the rest of the years as the temperature was mostly consistent.



The correlation coefficient was used to determine how strong the relationship between variable years and average temperature was. There is a positive correlation between these variables. Our result is 0.75 or 75% which means the variables have a moderate positive correlation. I took an average of the moving average to get an average temperature of 8.4(C) for the city and 14(C) for the global average.