



Exploring Weather Trends, Globally & Locally

Udacity Data Analyst Nanodegree Project

By William Townsend



How did we get the data in this presentation?

Data was pulled from Udacity's temperature database, using the following SQL Queries:

SQL Script to pull city-level data:

```
SELECT *  
FROM city_data  
WHERE city = 'Denver';
```

SQL Script to pull global data:

```
SELECT *  
FROM global_data;
```



An alternative method...

An alternative method would be to join our two SQL queries, getting data for both in one spreadsheet:

Joining the two to just pull the data I want in one CSV:

```
SELECT global_data.year, global_data.avg_temp AS global_avg,  
       city_data.city, city_data.country, city_data.avg_temp AS city_avg  
FROM global_data  
JOIN city_data  
ON global_data.year = city_data.year  
WHERE city_data.city = 'Denver';
```



What to do with the data?

I downloaded the data into a CSV from Udacity, containing the results of my SQL queries, which I could handle and put into a line graph in Excel.

I immediately noticed that data for Denver is available in 1775 & 1776, but no other local data is available until 1820, nearly 50 years later. As the data in these two years would not be relevant to a trend 50 years later, I decided to ignore these two datapoints and only work with the data from 1820 - 2013, for which data was available for both Denver and the world at large.

The assignment requires the use of a moving average to smooth out the data for an easier comparison between global and local temperatures, though it does not require a specific timeframe for that moving average.

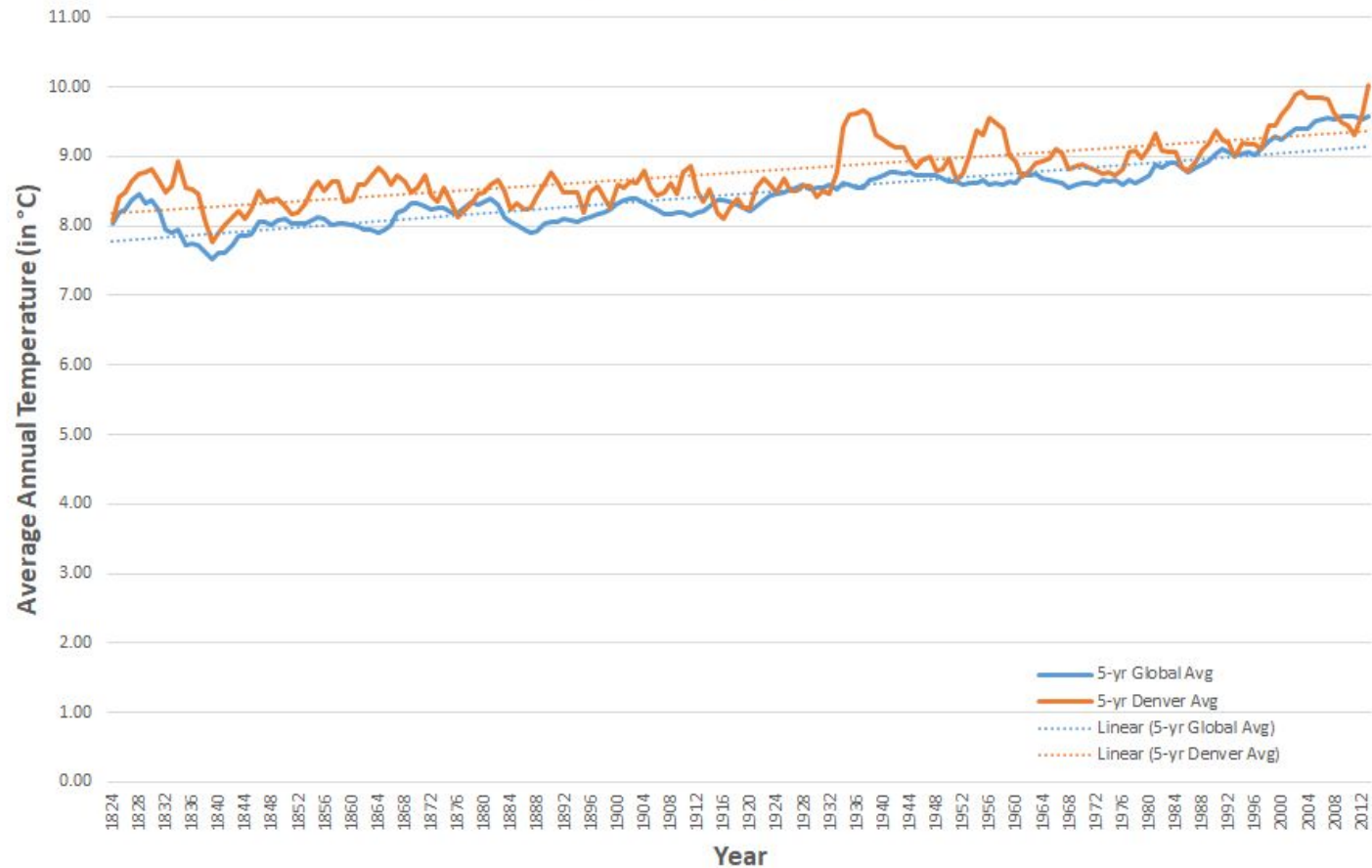


Handling the data (cont)

I considered a 10-year average, but I was concerned that this would smooth out the data *too much* by eliminating too many minor fluctuations. I tried a 5-year average, using the AVERAGE() function in Excel beginning in 1824 (data from 1820 - 1824) and copy/pasting the formula all the way to 2013. This was done identically to the process shown in the lesson. I felt like the 5-year moving average worked well on the graph, so I stuck with that metric.

After graphing the data, I felt like the trends were close, but not quite the same. It looked like the global trend was catching up to the city trend, but it was tough to tell for sure, so I applied trendlines to the graph to verify.

5-Year Moving Average Temperature (°C) for Denver vs Global (1820 - 2013)





What observations can we make from this data?

- Denver's average temperature looks relatively flat from 1820 to the 1930s, at which time it started to climb upwards.
- The global average temperature looks relatively flat from 1820 to about the 1900s, certainly by the 1910s.
- Denver's average temperature during this time period has always been warmer than the global average. However, Denver was about 0.25 degrees warmer at the start of the sample, and it is only about 0.10 degrees warmer at the end of the sample.
- This indicates that the trend for the global temperature increase is steeper than the Denver temperature increase. If these trends continue, at some point in the next few decades, the average global temperature will be higher than Denver's average temperature.