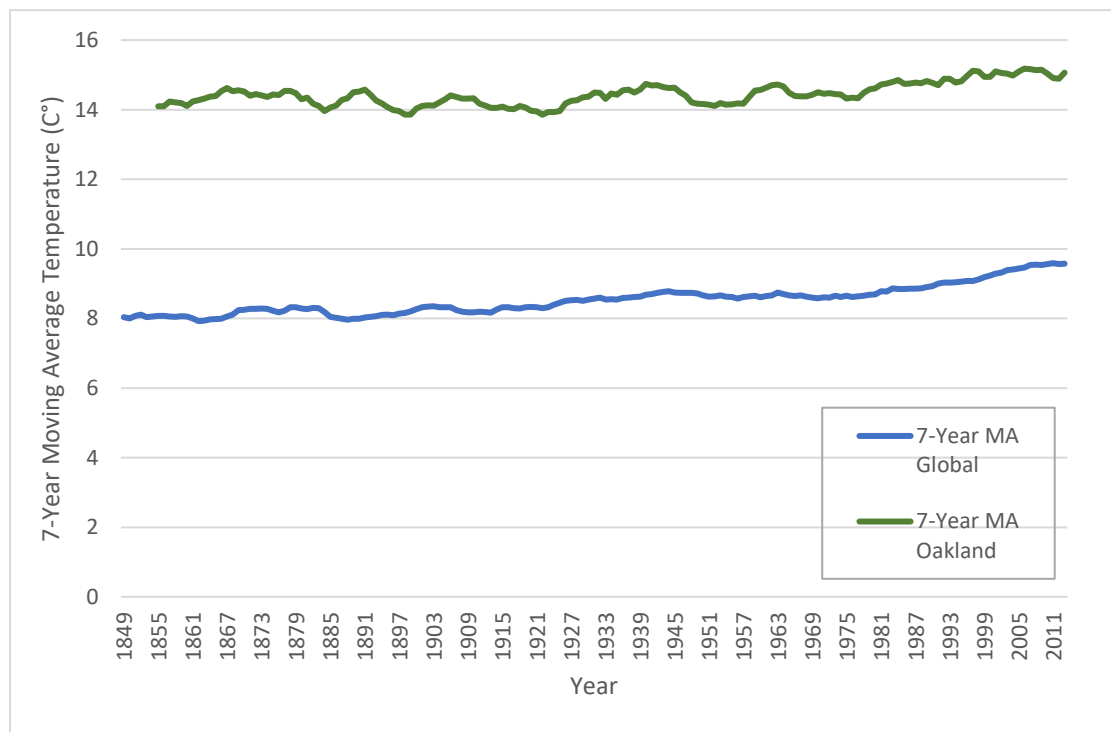


Project 1: Explore Weather Trends

Data Comparisons for Global Average Temperature and Oakland Average Temperature

By Michael Reddell

In order to examine weather trends between global temperatures (as measured in Celsius) and local weather temperatures (Oakland, California, USA), data from the years 1750 to 2015 was collected from Udacity's weather database. Due to not having enough data, Oakland data was only used from the years 1849 to 2013. Oakland was found to be, on average, hotter than global temperatures by about 6°C. Between the years of 1882 and 1900, average Oakland temperatures increased and then decreased while in contrast, average global temperatures decreased and then increased. Differences between Oakland average temperatures and global average temperatures stayed fairly consistent over time. An overall trend of an increasing average temperature was found between the years of 1849 and 2013 for both Oakland and global data. Average temperatures for Oakland remained between 13.5°C and 15.5°C. Average temperatures globally remained between 8°C and 10°C. From 1849 to 1915, average temperatures for both data sets remained relatively stagnant. The largest increase in average temperature was observed from 1915 to 2013 in both data sets.



1. Step 1: Extracting Data – data was extracted online from the Udacity database using two SQL queries and then exporting them as CSV files.

*prior to extracting data, user used SQL to examine the city_list column in order to choose a local major city. Oakland, California, USA was selected.

Input

HISTORY

MENU

SCHEMA

city_data

city_list

city

country

global_data

1

select *

2

from city_list

Success!

EVALUATE

Output

345 results

Download CSV

Nouakchott	Mauritania
Novosibirsk	Russia
Oakland	United States
Oklahoma City	United States
Omaha	United States

*year and avg_temp was then extracted from city_data for Oakland

Input

HISTORY

MENU

SCHEMA

city_data

year

city

country

avg_temp

1

select year,avg_temp

2

from city_data

3

where city='Oakland'

Success!

EVALUATE

Output

165 results

Download CSV

year	avg_temp
1849	14.12
1850	13.80
1851	14.39

*year and avg_temp was then extracted from global_data

The screenshot shows a data query interface. On the left, under the 'Input' tab, there is a 'SCHEMA' section with a refresh icon. Below it, a list of fields is shown: 'city_data', 'city_list', 'global_data', 'year', and 'avg_temp'. Each field has a dropdown arrow. To the right of the schema, a SQL query is entered in a text area:

```
1 select year, avg_temp
2 from global_data
```

Below the query, a green bar indicates 'Success!'. To the right of this bar is a blue button labeled 'EVALUATE'. Below the 'Input' section, the 'Output' section shows '266 results' and a 'Download CSV' link. The output is displayed as a table with two columns: 'year' and 'avg_temp'. The first four rows of data are shown:

year	avg_temp
1750	8.72
1751	7.98
1752	5.78
1753	8.39

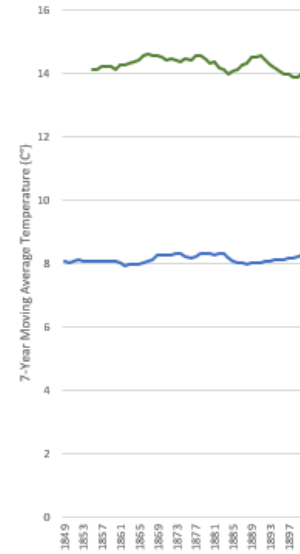
Step 2: Open up the CSV - both CSV files were opened using Microsoft Excel for Office 365.

Step 3: Create a line chart – average temperature was copied from the Oakland file to a new column in the Global file. Temperatures were started at the year 1849 since data from prior years were unavailable. Two new columns were created that were named “7-Year MA Global” and “7-Year MA Oakland”. These two columns were to represent the 7-year moving averages. In Excel, data for the first 7 years for global average temperature was selected and an average was calculated in excel and entered in the 7-year ma global column. The same formula was used for the average Oakland temperature data and put into the 7-year ma column for Oakland. Next, a line chart was created using data from both of the 7-year moving average columns for the years 1849 to 2013.

G6

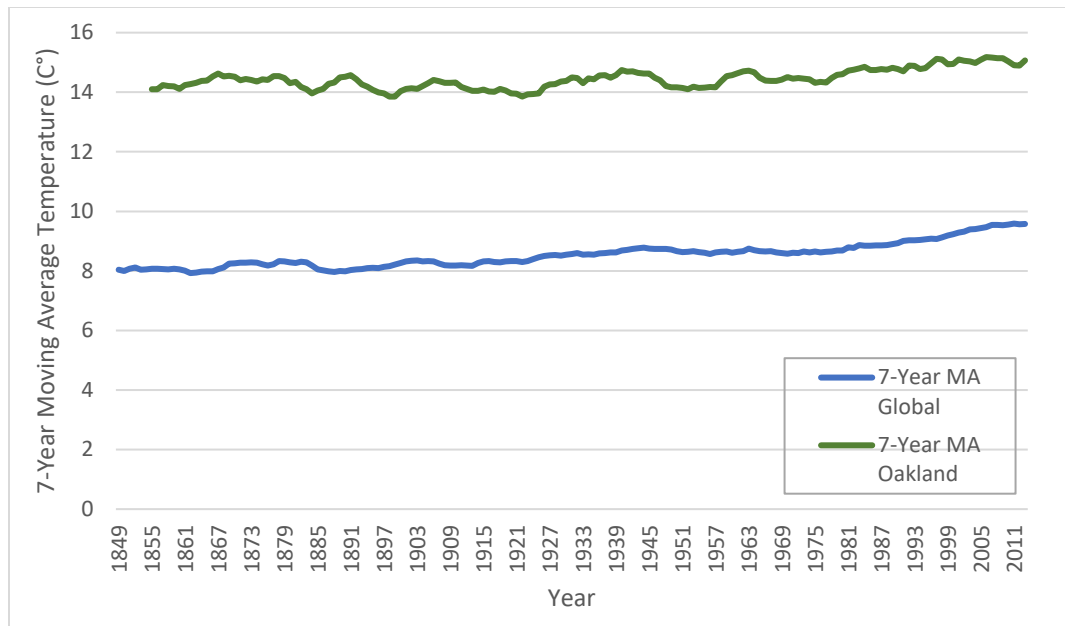
	A	B	C	D	E	F	G	H	I	J	K	L
1	year	avg_temp	7-Year MA global	avg_temp_oakland	7-Year MA Oakland							
2	1750	8.72										
3	1751	7.98										
4	1752	5.78										
5	1753	8.39										
6	1754	8.47										
7	1755	8.36										
8	1756	8.85	8.078571429									
9	1757	9.02	8.121428571									
0	1758	6.74	7.944285714									
1	1759	7.99	8.26									
2	1760	7.19	8.088571429									
3	1761	8.77	8.131428571									
4	1762	8.61	8.167142857									
5	1763	7.5	7.974285714									
6	1764	8.4	7.885714286									
7	1765	8.25	8.101428571									
8	1766	8.41	8.161428571									
9	1767	8.22	8.308571429									
10	1768	6.78	8.024285714									
11	1769	7.69	7.892857143									
12	1770	7.69	7.92									
13	1771	7.85	7.841428571									
14	1772	8.19	7.832857143									
15	1773	8.22	7.805714286									
16	1774	8.77	7.884285714									
17	1775	9.18	8.227142857									
18	1776	8.3	8.314285714									
19	1777	8.26	8.395714286									
20	1778	8.54	8.494285714									
21	1779	8.98	8.607142857									
22	1780	9.43	8.78									
23	1781	8.1	8.684285714									
24	1782	7.9	8.501428571									
25	1783	7.68	8.412857143									
26	1784	7.86	8.355714286									
27	1785	7.36	8.187142857									
28	1786	8.26	8.084285714									
29	1787	8.03	7.884285714									
30	1788	8.45	7.934285714									
31	1789	8.33	7.995714286									
32	1790	7.98	8.038571429									
33	1791	8.23	8.091428571									
34	1792	8.09	8.195714286									
35	1793	8.23	8.191428571									
36	1794	8.53	8.262857143									
37	1795	8.35	8.248571429									
38	1796	8.27	8.24									
39	1797	8.51	8.315714286									
40	1798	8.67	8.378571429									
41	1799	8.51	8.438571429									
42	1800	8.48	8.474285714									
43	1801	8.59	8.482857143									
44	1802	8.58	8.515714286									
45	1803	8.5	8.548571429									
46	1804	8.84	8.595714286									
47	1805	8.56	8.58									
48	1806	8.43	8.568571429									



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Oakland





Notes and Observations: When deciding how to visualize trends, I followed the directions that told to use a line chart. At first I charted the data from 1750 to 2015 but then changed it to only include the years for the data that I had for both Oakland and globally. I wanted to make sure the chart looked easy to read and added a legend, the years on the x-axis, and a description of the y-axis which was “7-Year Moving Average Temperatures” since that was the data that I put into my line chart.