Project Outline

This project compares the temperature trend between Long Beach, and the overall global temperature trends between the year 1849 and 2013. The data used for this project was extracted from Udacity's database using SQL queries, and was exported to CSV. Excel was used to open the CSV files, compute moving averages, visualize the data, and compute correlation coefficients between the temperature averages. Since the data for the city was between the years 1849 and 2013, I extracted those years from the global data.

Data Extraction

```
SELECT *
FROM city_list
WHERE country IN ('United States');

SELECT *
FROM city_data
WHERE city IN ('Long Beach');

SELECT *
FROM global_data
WHERE year BETWEEN 1849 AND 2013;
```

Moving Average

Long Beach Data						
year	city	country	city_avg_temp	Long Beach 3-Year MA	5-Year MA	7-Year MA
1849	Long Beach	United States	16.03			
1850	Long Beach	United States	15.55			
1851	Long Beach	United States	15.66	15.75		
1852	Long Beach	United States	16.06	15.76		
1853	Long Beach	United States	16.69	16.14	16.00	
1854	Long Beach	United States	16.11	16.29	16.01	
1855	Long Beach	United States	16.31	16.37	16.17	16.06
1856	Long Beach	United States	15.75	16.06	16.18	16.02
1857	Long Beach	United States	16.41	16.16	16.25	16.14
1858	Long Beach	United States	15.96	16.04	16.11	16.18
1859	Long Beach	United States	15.64	16.00	16.01	16.12
1860	Long Beach	United States	15.74	15.78	15.90	15.99
1861	Long Beach	United States	16.82	16.07	16.11	16.09
1862	Long Beach	United States	16.37	16.31	16.11	16.10
1863	Long Beach	United States	16.1	16.43	16.13	16.15
1864	Long Beach	United States	16.87	16.45	16.38	16.21
1865	Long Beach	United States	16.18	16.38	16.47	16.25
1866	Long Beach	United States	16.64	16.56	16.43	16.39

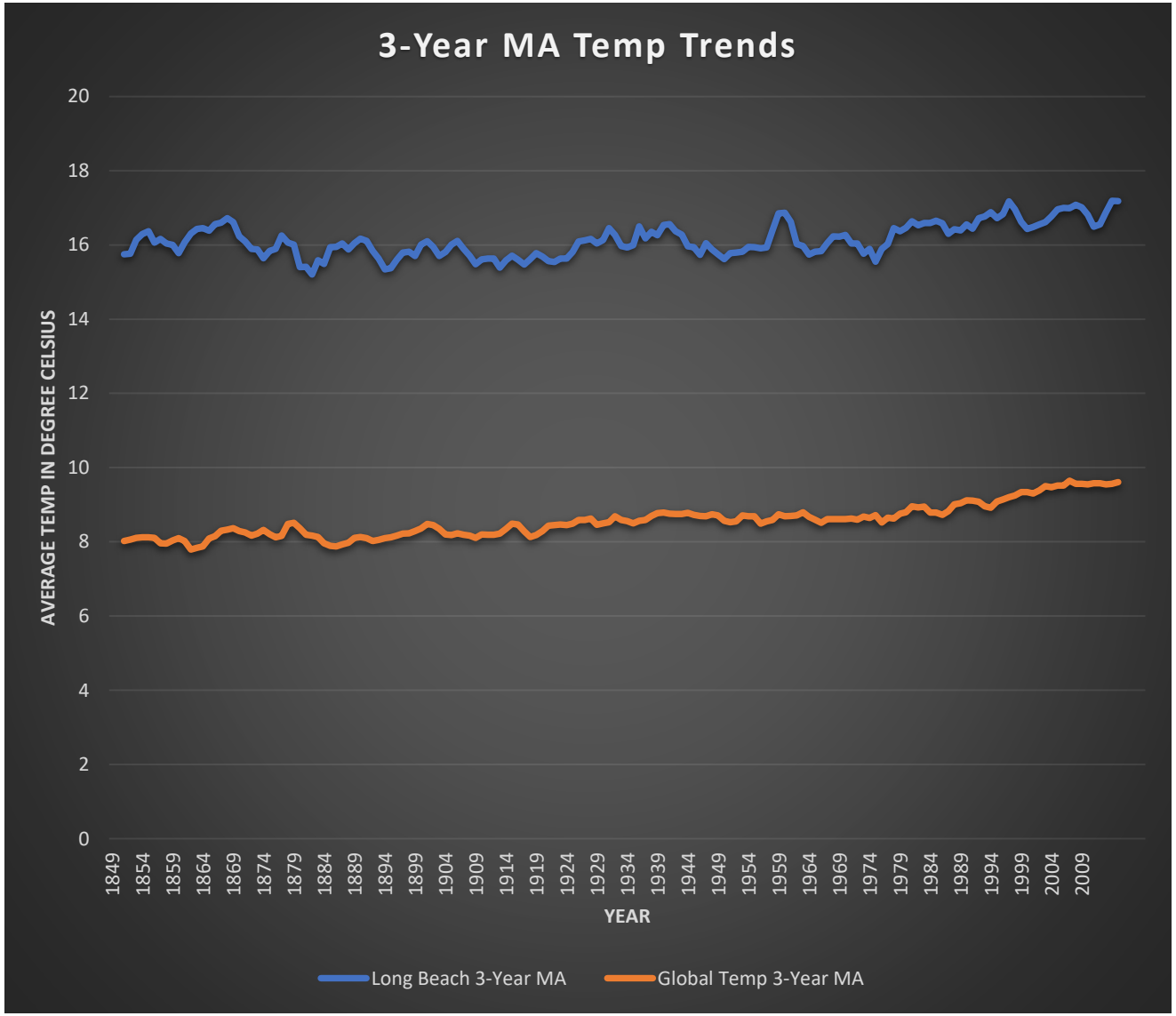
Moving Average

Global Temperature Trends				
year	global_avg_temp	3-Year MA	5-Year MA	7-Year MA
1849	7.98			
1850	7.9			
1851	8.18	8.02		
1852	8.1	8.06		
1853	8.04	8.11	8.04	
1854	8.21	8.12	8.09	
1855	8.11	8.12	8.13	8.07
1856	8	8.11	8.09	8.08
1857	7.76	7.96	8.02	8.06
1858	8.1	7.95	8.04	8.05
1859	8.25	8.04	8.04	8.07
1860	7.96	8.10	8.01	8.06
1861	7.85	8.02	7.98	8.00
1862	7.56	7.79	7.94	7.93
1863	8.11	7.84	7.95	7.94
1864	7.98	7.88	7.89	7.97
1865	8.18	8.09	7.94	7.98
1866	8.29	8.15	8.02	7.99

Data Visualization

- Question: Is Long Beach hotter or cooler on average compared to the global average? Has the difference been consistent over time?

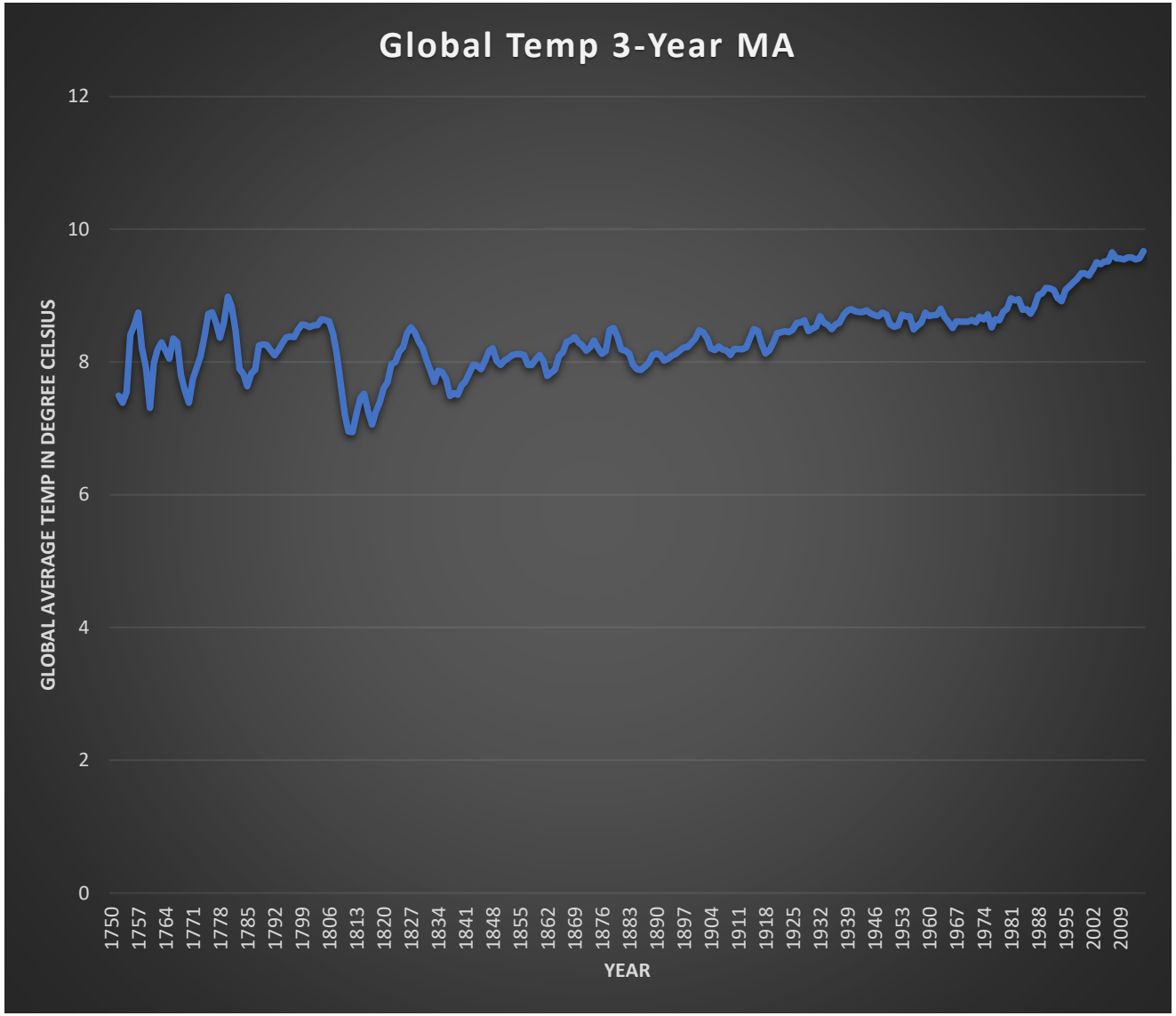
- Answer: The 3-year moving average shows that Long beach has always been hotter than the global average and this difference has remained consistent over the period analyzed.



Data Visualization

- Question: What does the overall trend look like? Is the world getting hotter or cooler? Has the trend been consistent over the last few hundred years?

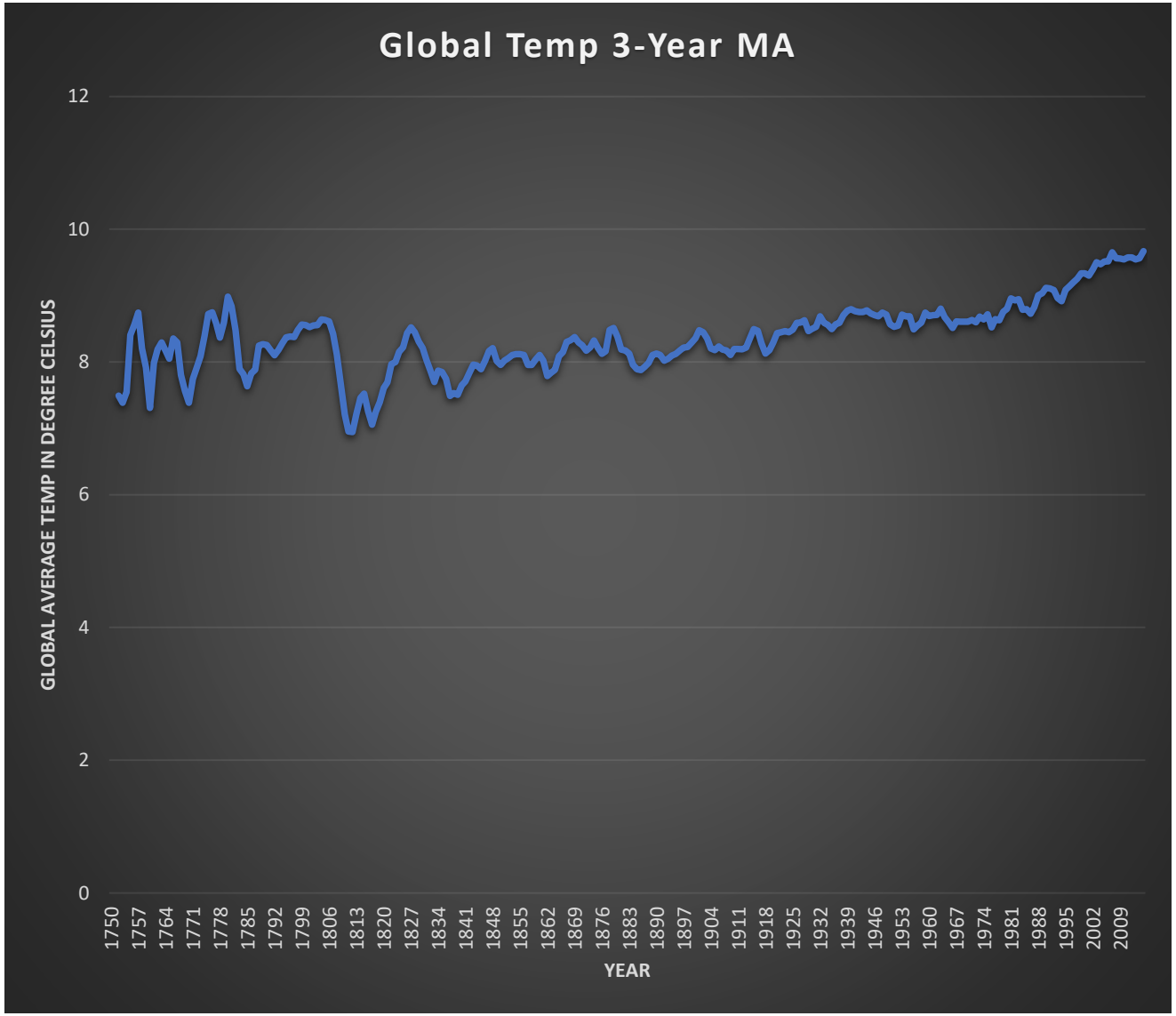
- Answer: The 3-year moving average shows that while the global temperature average rose and fell in the 1700's and the 1800's, the world has consistently gotten hotter since the 1900's up until the 2010's.



Data Visualization

- Question: Which time period can be considered as the world's coolest?

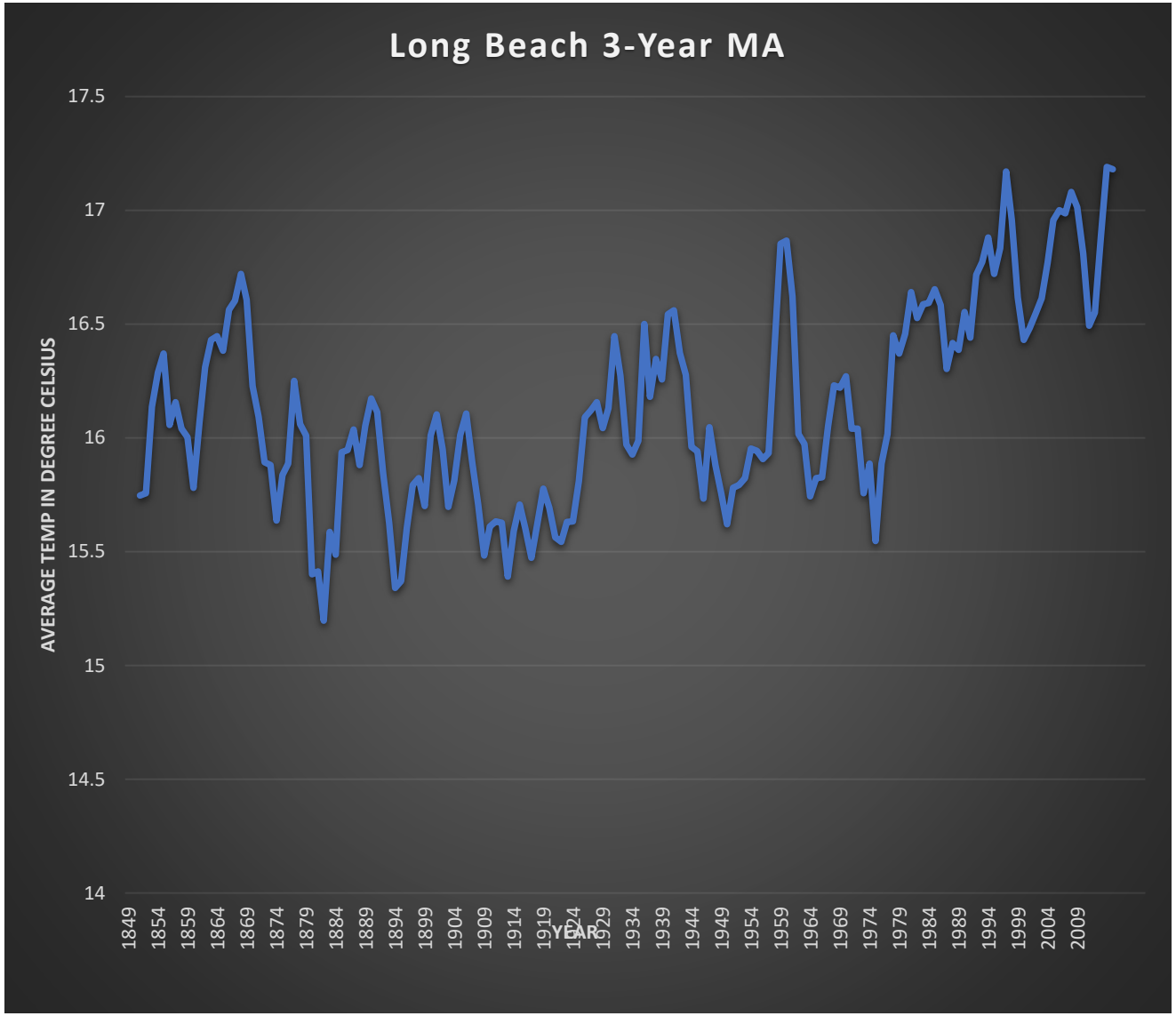
- Answer: The 3-year moving average shows that global temperature average was at its lowest in the early 1800's, precisely between the years 1806 and 1813.



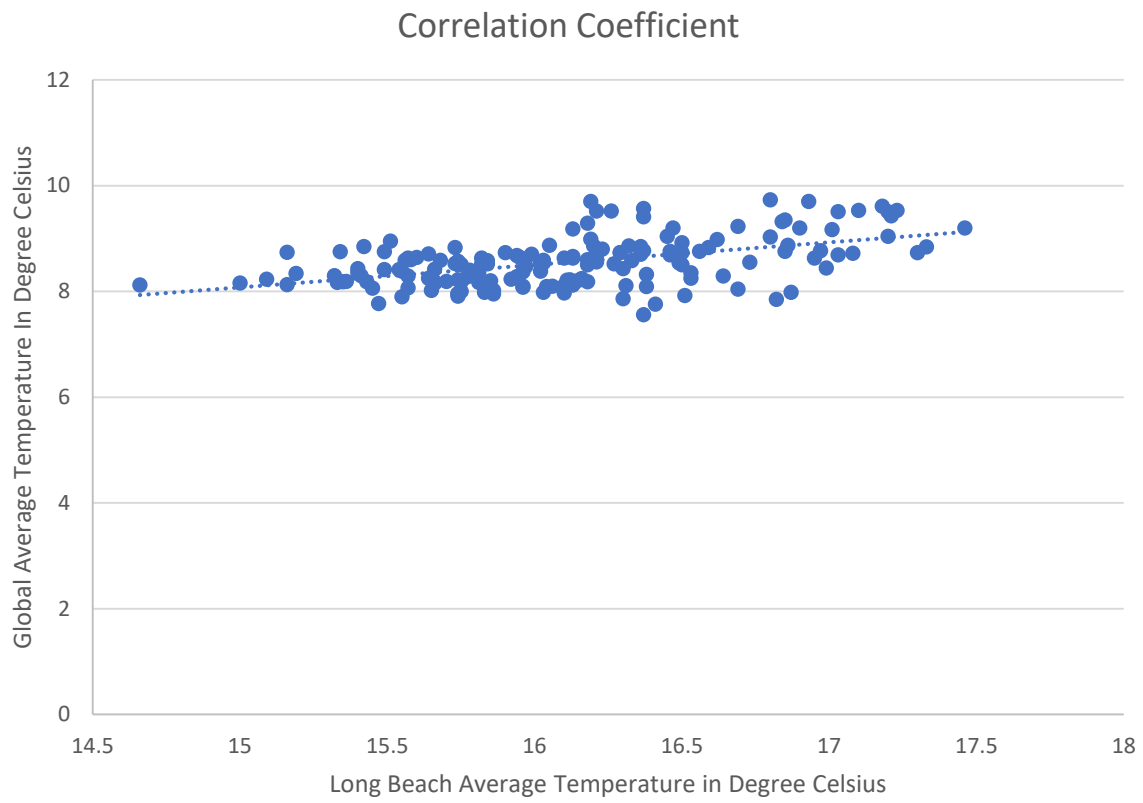
Data Visualization

- Question: Which time period can be considered as the Long Beach's coolest?

- Answer: The 3-year moving average for the city shows that city's temperature average was at its lowest in between the years 1870 and 1884.



Correlation Coefficients



Question: What is the correlation coefficient between the global average temperature and Long Beach average temperature?

- Answer: The value of the correlation coefficient was computed with Excel is 0.51 using the global average temperature and Long Beach average temperature. There is a moderate positive linear relationship between both variables.