Exploring Weather Trends
Kaori Ishikawa
16 August 2020

Introduction

In this project, I will analyse local and global temperature data and compare the temperature trends where I live, Amsterdam, to overall global temperature trends.

Outline of steps

From the database in Udacity platform, I extracted excel files containing the average global temperature and the average temperature in Amsterdam by year in Celsius. I used the SQL query as follows to download the data and used excel for all the other steps.

Query to extract the Global data:
```
SELECT *
    FROM global_data
```
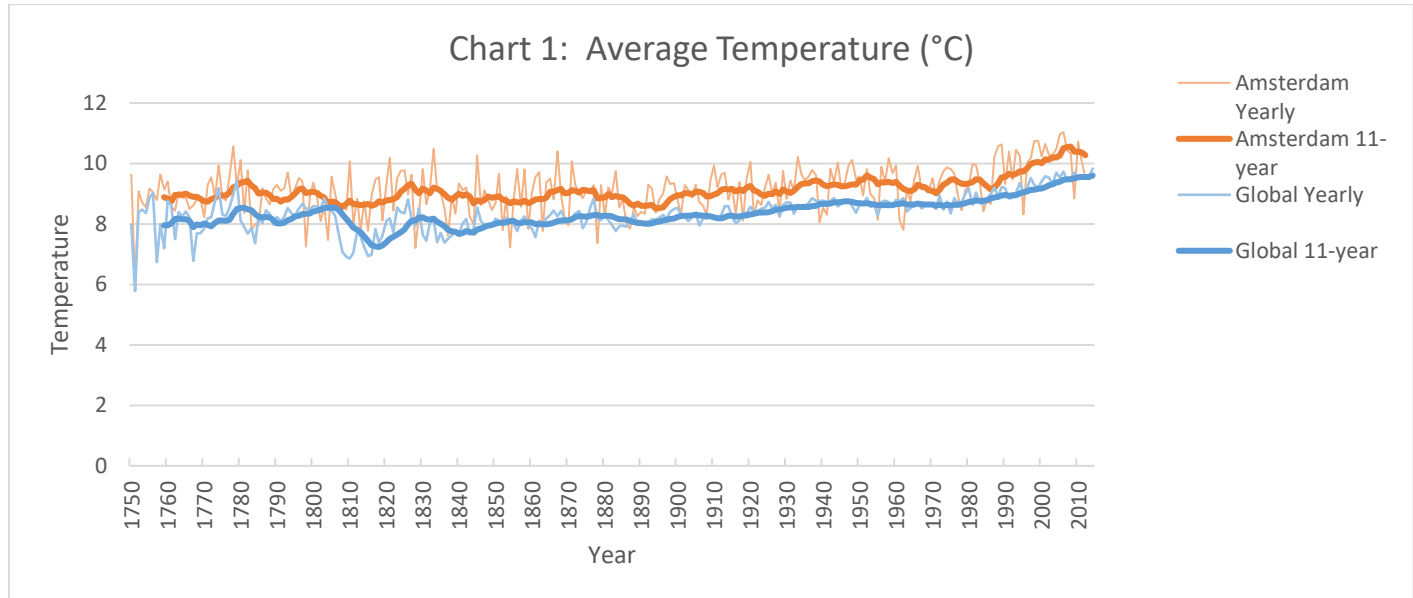
Query to extract the data in Amsterdam:
```
SELECT *
    FROM city_data
    WHERE city = 'Amsterdam'
```

The data in Amsterdam contains the yearly average from 1743 to 2013, but I decided to use the data only after 1750 as some values are missing before 1750. The Global data contains the data from 1750 to 2015. For the moving average, I calculated the average over 11 years, based on the fact that the solar cycle is 11 years. Also, I calculated the correlation coefficient and the difference between the average global temperature and the average temperature in Amsterdam by years. For the calculation of the difference, I removed the year 2014 and 2015 as there is no data in Amsterdam.

Line Chart

The following chart is a line chart of the average of the temperature in Amsterdam and the global temperature.

Chart 1: Average Temperature (°C)

Observations

My observations are as follows.

- Overall, the average temperature of Amsterdam is higher than the global average. The average difference is +0.77 °C and the median is + 0.82°C.
- I plotted the temperature difference by year and the 11-year moving average of it in Chart 2 below. Chart 2 does not show a remarkable trend for recent 100 years.
- The correlation coefficient is 0.52 between the average temperature of Amsterdam the global average temperature and there is a moderate correlation.
- Overall, the global temperature is slowly going up from around 100 years ago. The temperature in Amsterdam shows also similar trends. Especially after 1987, this trend is remarkable in Amsterdam.

Chart 2: Temperature difference (°C)