# GLOBAL WARMING AND HIS ACTION IN MAXIMAL AND MINIMAL TEMPERATURE VARIATIONS ON THE CONTINENT.

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## Abstract

The projection of global medium temperatures on Earth in 2100 anticipates a global increase with a more important warming in northern latitude than southern.
We want to simply quantify the global warming and show that variations on minimal temperatures are upper than maximal for different stations (comparing the average of the last thirty years).
We search stations approximately all 10° in Europe with search tool GLOBE.
Then we collect temperature data's for the different stations (year 2016) and climatic data's for the same stations.
For global warming, we have 80/96 averages of 2016 (83%) upper than climatic values.
The sample of weather stations is rather small (4 stations) but each time the correlation is quite strong, global warming is well noticeable and for 4 different places.
For the deviations between maxima and minima, 32/48 minima deviations are upper than maxima deviations (66,6%).
This is not a strong correlation but a certain trend that shows that global warming is marked by a greater increase in minimum than maxima.
To continue the search we should use more weather stations and over several years.

Key words : global warming ; minimum or maximum monthly average temperature.

## Research questions

The scientific community foresees global warming of varying degrees depending on the scenarios of $CO_2$ production for the end of this century. The rise in global temperature should be higher for high latitudes.



Source : fith IPCC report

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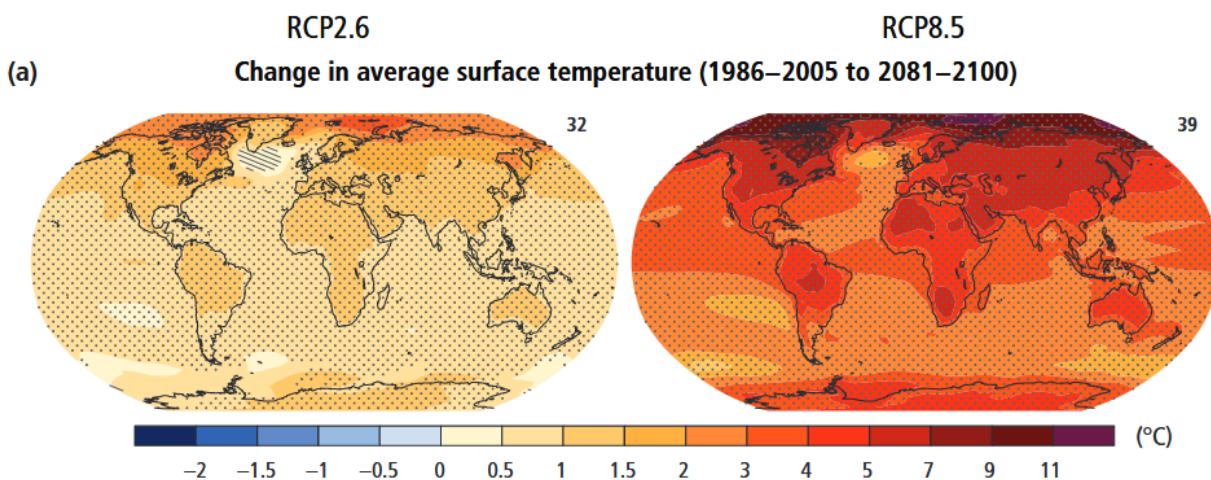
**The first goal** of this research is to show that global warming is global, at least on a European scale. This study aims to make citizens (and students first) aware that global warming is a global problem and not only a local problem.

**The second aim** of this research is to show that global warming is more important on the minimum monthly averages than on the maximum.

A scientific study carried out in France shows that the average rise in the minimum monthly temperature (left map) is greater than maximum.(right map)



Source : Météo France
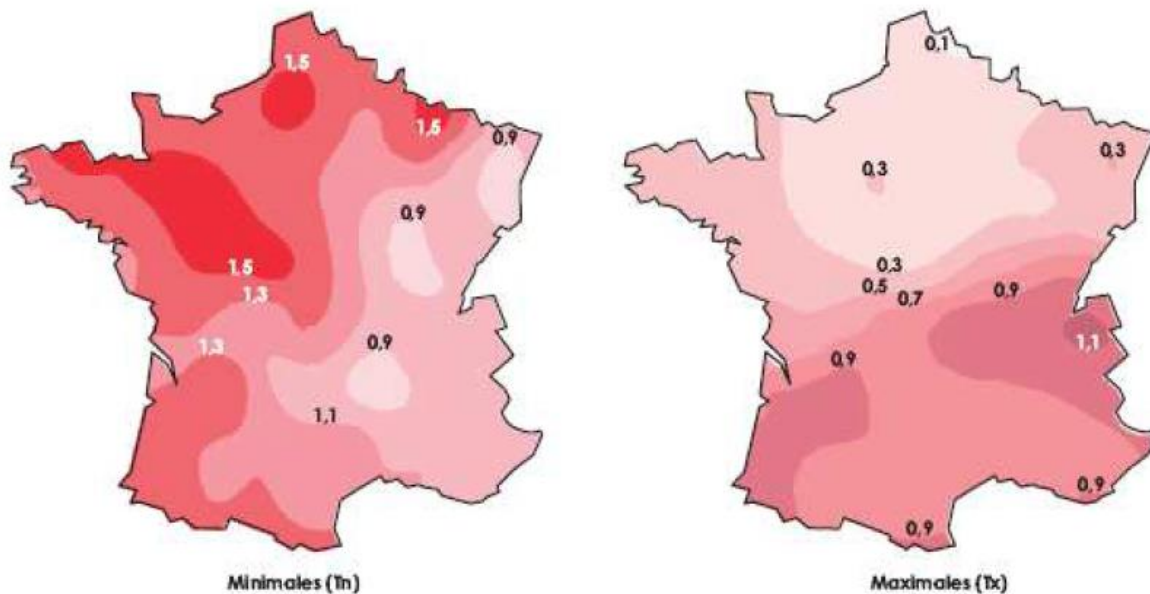
Increase in the annual average of the minimum and maximum daily temperature in metropolitan France over the period 1901 - 2000 (° C)

We wanted to know if, with the GLOBE partial data collected by the students, with thermometers less precise than those used in the professional weather stations; we could find these results on a european scale.

# Hypothesis

- If there is global warming at present it should be possible to register it at all stations in Europe
- We assume that the minimum temperatures would increase more than the maximum

# Research methods

- Using the advanced data access tool we looked for the weather stations that had the most data (eg using DAVIS stations, we have at school a DAVIS weather station). We wanted to find stations every ten degrees of latitude : for example Ohmoor (latitude 53°N…10 degrees more than our Palissy station)



- we founded 4 stations : our station Palissy, 43°N in France; Ohmoor, 53°N in Germany; Helsingen, 60°N and Utajarven 65°N in Finland.
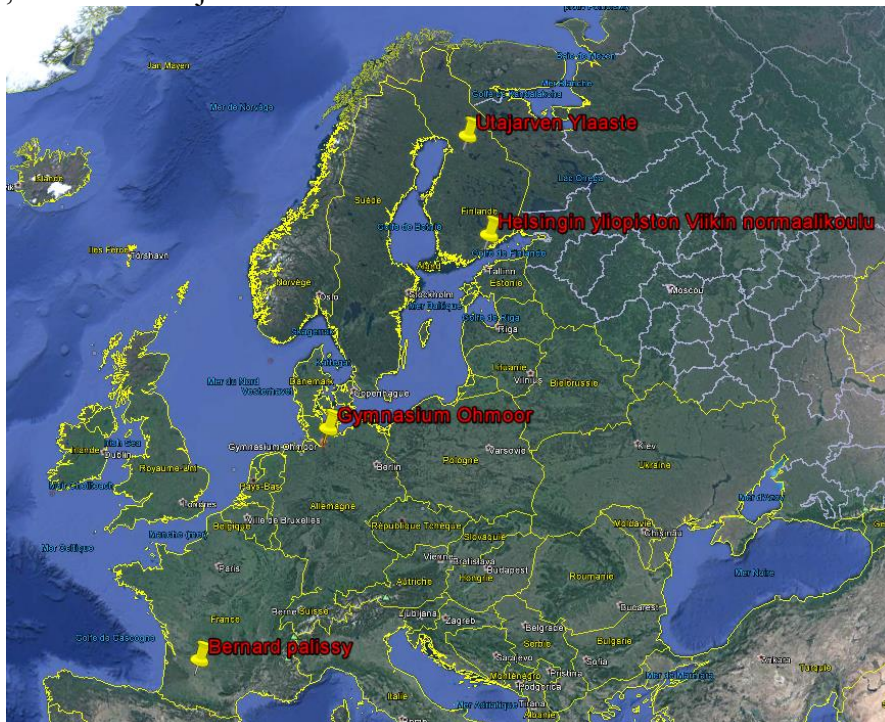
- Then, for the year 2016, all the minimum and maximum temperature values for the 4 stations were downloaded from the GLOBE database.
  For example Ohmoor :



- For the climate data we searched the values on the World Weather Web site

  For example  Hamburg (Ohmoor) (see the link in the bibliography)

## Climatological Information



**Hamburg** — 30-year period
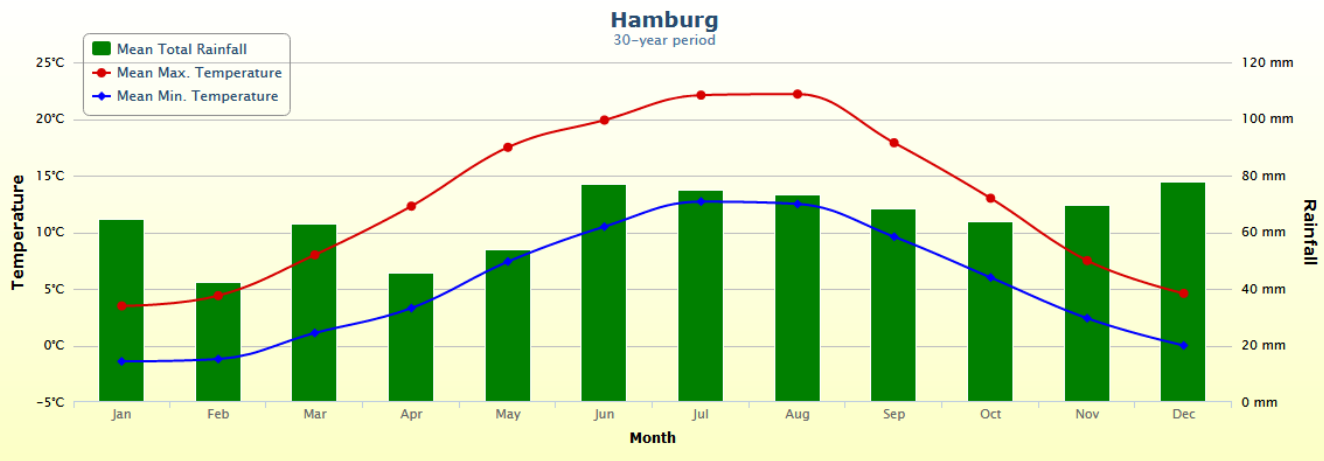
| Month | Mean Daily Minimum Temperature (°C) | Mean Daily Maximum Temperature (°C) | Mean Total Rainfall (mm) | Mean Number of Rain Days |
|-------|-------------------------------------|-------------------------------------|--------------------------|--------------------------|
| Jan | -1.4 | 3.5 | 64.4 | 12.1 |
| Feb | -1.2 | 4.4 | 42.4 | 9.2 |
| Mar | 1.1 | 8 | 62.9 | 11.3 |
| Apr | 3.3 | 12.3 | 45.6 | 8.9 |
| May | 7.4 | 17.5 | 53.7 | 9.6 |
| Jun | 10.5 | 19.9 | 76.9 | 11.3 |
| Jul | 12.7 | 22.1 | 74.7 | 11.4 |
| Aug | 12.5 | 22.2 | 73 | 10.2 |

We have searched for professional weather stations closest to GLOBE schools.

For the northernmost station we could not find the climate data corresponding to the GLOBE school. So we sent an email to the responsible teacher to give us the climate data. She provided us with this "climatic" data but the average was done over 13 years rather than 30 years: we decided to choose a station farther from the school but with an average over 30 years.

For schools in Palissy, Ohmoor and Helsingin, the professional weather stations are less than 5 km away and for Utajarven the professional weather station is 53 km from the GLOBE school.

- In the next step and to answer the **first problem** we calculated in a spreadsheet the minimum and maximum monthly averages for each station

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Measured At | Minimum Temp | | | | | | | |
| 2 | 03/01/2016 11:20 | -6,1 | | Étiquettes de lignes ▼ | Moyenne de Minimum Temp | | | | |
| 3 | 04/01/2016 11:20 | -7,5 | | (vide) | | | | | |
| 4 | 05/01/2016 11:20 | -6,9 | | janv | -0,727586207 | | | | |
| 5 | 06/01/2016 11:20 | -5,8 | | févr | 1,323809524 | | | | |
| 6 | 07/01/2016 11:20 | -6,4 | | mars | 1,644827586 | | | | |
| 7 | 08/01/2016 11:20 | -4 | | avr | 5,1 | | | | |
| 8 | 09/01/2016 11:20 | -0,9 | | mai | 9,641935484 | | | | |
| 9 | 10/01/2016 11:20 | 0,7 | | juin | 10,77666667 | | | | |
| 10 | 11/01/2016 11:20 | 0,2 | | juil | 10,18571429 | | | | |
| 11 | 12/01/2016 11:20 | 1,5 | | août | 12,97692308 | | | | |
| 12 | 13/01/2016 11:24 | 2,2 | | sept | 13,01333333 | | | | |
| 13 | 14/01/2016 11:20 | 1 | | oct | 7,340740741 | | | | |
| 14 | 15/01/2016 11:20 | 1,1 | | nov | 1,853333333 | | | | |
| 15 | 16/01/2016 11:20 | -0,7 | | déc | 2,583870968 | | | | |
| 16 | 17/01/2016 11:20 | -2,1 | | Total général | 6,382789318 | | | | |

E13

| | months | minimal monthly climatic average °C | 2016 minimum monthly average °C | | | |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | january | -1,4 | -0,7 | | | |
| 4 | february | -1,2 | 1,3 | | | |
| 5 | march | 1,1 | 1,6 | | | |
| 6 | april | 3,3 | 5,1 | | | |
| 7 | may | 7,4 | 9,6 | | | |
| 8 | june | 10,5 | 10,8 | | | |
| 9 | july | 12,7 | 10,2 | | | |
| 10 | august | 12,5 | 13,0 | | | |
| 11 | september | 9,6 | 13,0 | | | |
| 12 | october | 6 | 7,3 | | | |
| 13 | november | 2,4 | 1,9 | | | |
| 14 | december | 0 | 2,6 | | | |
| 15 | | | | | | |
| 16 | | | | | | |

- The annual variation curves (see results further) for the minima and the maxima will be plotted. We will count for each month the values of 2016 which are higher than the climatic values. The synthesis of these values for the 4 stations will be made to draw the conclusion.

- In order to answer the **second question** we calculate the difference between the minimum monthly average for 2016 and the minimum monthly climatic average.

I10

| | months | minimal monthly climatic average °C | 2016 minimum monthly average °C | difference between 2016 and climatic average | | | |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 3 | january | -1,4 | -0,7 | 0,7 | | | |
| 4 | february | -1,2 | 1,3 | 2,5 | | | |
| 5 | march | 1,1 | 1,6 | 0,5 | | | |
| 6 | april | 3,3 | 5,1 | 1,8 | | | |
| 7 | may | 7,4 | 9,6 | 2,2 | | | |
| 8 | june | 10,5 | 10,8 | 0,3 | | | |
| 9 | july | 12,7 | 10,2 | -2,5 | | | |
| 10 | august | 12,5 | 13,0 | 0,5 | | | |
| 11 | september | 9,6 | 13,0 | 3,4 | | | |
| 12 | october | 6 | 7,3 | 1,3 | | | |
| 13 | november | 2,4 | 1,9 | -0,5 | | | |
| 14 | december | 0 | 2,6 | 2,6 | | | |
| 15 | | | | | | | |

- Then we calculate the difference between the maximum monthly average for 2016 and the maximum monthly climatic average.
- We calculate the difference between the minimum deviations and the maximum deviations: **if the calculated value is positive it will mean that global warming is more important for the minima than for the maxima.**

| | months | difference between 2016 minimum and climatic average | difference between 2016 maximum and climatic average | difference between the minimum deviation and the maximum deviation |
|---|---|---|---|---|
| 32 | january | 0,7 | -0,2 | 0,9 |
| 33 | february | 2,5 | 2,4 | 0,2 |
| 34 | march | 0,5 | 0,5 | 0,0 |
| 35 | april | 1,8 | 1,0 | 0,8 |
| 36 | may | 2,2 | 2,9 | -0,6 |
| 37 | june | 0,3 | 3,2 | -2,9 |
| 38 | july | -2,5 | 1,0 | -3,5 |
| 39 | august | 0,5 | 0,4 | 0,1 |
| 40 | september | 3,4 | 5,2 | -1,8 |
| 41 | october | 1,3 | -0,4 | 1,8 |
| 42 | november | -0,5 | 0,1 | -0,6 |
| 43 | december | 2,6 | 2,1 | 0,5 |

- All positive gaps on minimum and maximum will be counted and summarized in a synthetic table to draw a conclusion

# Results

**First goal : Quantify global warming on european scale**

**Station 1 : Palissy minimum monthly 2016 and climatic average, difference between minimum 2016 and climatic averages.**

| Palissy | minimum monthly 2016 average in °C | minimum monthly climatic average in °C | difference between minimum monthly 2016 average and minimum monthly climatic averages in °C |
|---|---|---|---|
| january | 5,8 | 2,2 | 3,6 |
| february | 5,1 | 2,5 | 2,6 |
| march | 5,5 | 4,5 | 1,0 |
| april | 8,7 | 6,6 | 2,1 |
| may | 11,6 | 10,4 | 1,2 |
| june | 15,2 | 13,5 | 1,7 |
| july | 17,1 | 15,5 | 1,6 |
| august | 16,8 | 15,4 | 1,4 |
| september | 15,3 | 12,3 | 3,0 |
| october | 9,8 | 9,8 | 0,0 |
| november | 7,2 | 5,4 | 1,8 |
| december | 2,9 | 2,9 | 0,0 |

**10 minimum values are upper than climatic values.**

Comparison of 2016 and climatic minimum monthly averages for Palissy
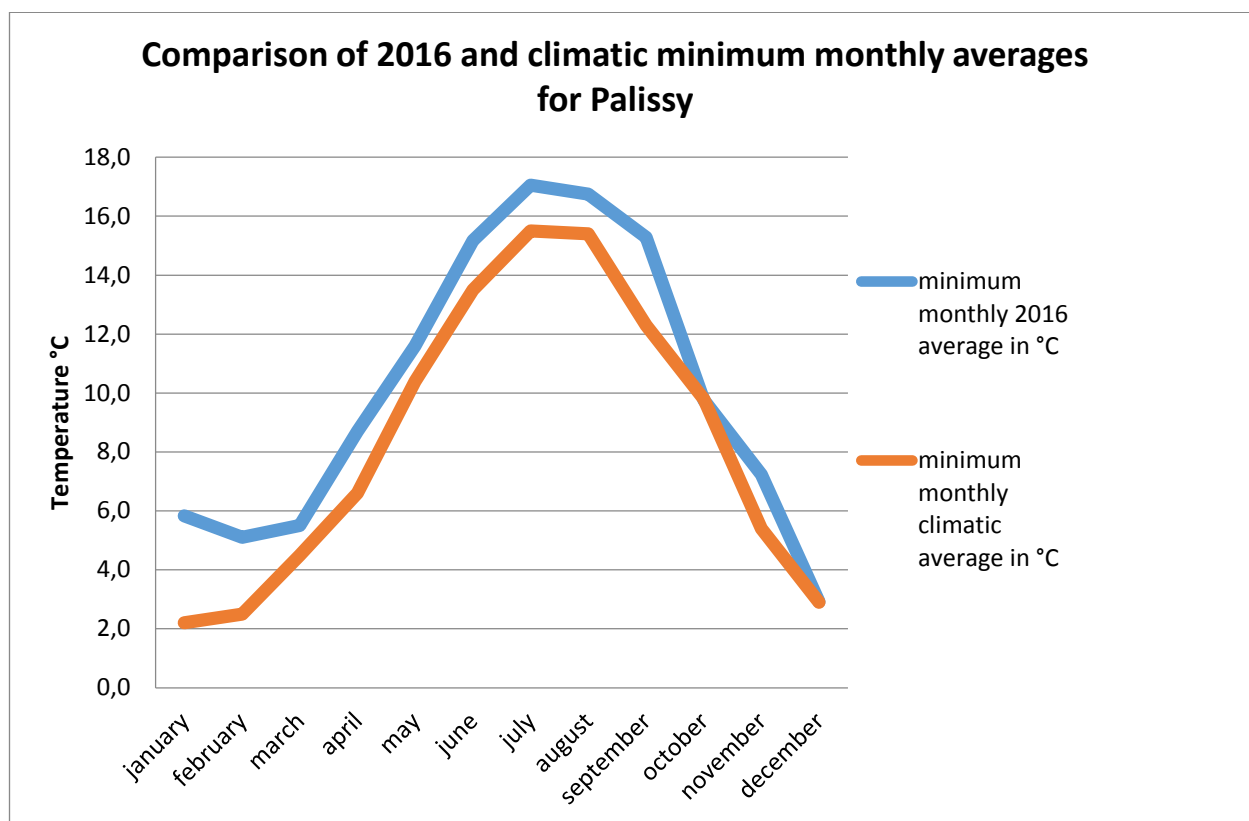
**Station 1 : Palissy maximum monthly 2016 and climatic average, difference between maximum 2016 and climatic averages.**

| Palissy | maximum monthly 2016 average in °C | maximum monthly climatic average in °C | difference between maximum monthly 2016 average and maximum monthly climatic averages in °C |
|---|---|---|---|
| january | 11,5 | 9,1 | 2,4 |
| february | 12,7 | 11,2 | 1,5 |
| march | 14,5 | 14,9 | -0,4 |
| april | 17,8 | 17,4 | 0,4 |
| may | 21,8 | 21,4 | 0,4 |
| june | 24,5 | 24,8 | -0,3 |
| july | 28,7 | 27,6 | 1,1 |
| august | 30,0 | 27,5 | 2,5 |
| september | 27,7 | 24,4 | 3,3 |
| october | 19,8 | 19,5 | 0,3 |
| november | 13,4 | 13 | 0,4 |
| december | 10,9 | 9,4 | 1,5 |

**10 maximum values are upper than climatic values.**

**Comparison of 2016 and climatic maximum monthly averages for Palissy**

**Station 2 : Ohmoor minimum monthly 2016 and climatic average, difference between minimum 2016 and climatic averages.**

| Ohmmor | minimal monthly climatic average °C | 2016 minimum monthly average °C | difference between 2016 minimum and climatic averages |
|---|---|---|---|
| january | -1,4 | -0,7 | 0,7 |
| february | -1,2 | 1,3 | 2,5 |
| march | 1,1 | 1,6 | 0,5 |
| april | 3,3 | 5,1 | 1,8 |
| may | 7,4 | 9,6 | 2,2 |
| june | 10,5 | 10,8 | 0,3 |
| july | 12,7 | 10,2 | -2,5 |
| august | 12,5 | 13,0 | 0,5 |
| september | 9,6 | 13,0 | 3,4 |
| october | 6 | 7,3 | 1,3 |
| november | 2,4 | 1,9 | -0,5 |
| december | 0 | 2,6 | 2,6 |

**10 minimum values are upper than climatic values.**

## Comparison of 2016 and climatic minimum monthly averages for Ohmoor



**Station 2 : Ohmoor maximum monthly 2016 and climatic average, difference between maximum 2016 and climatic averages.**

| Ohmmor | maximum monthly climatic average °C | 2016 maximum monthly average °C | difference between maximum 2016 and climatic averages |
|---|---|---|---|
| january | 3,5 | 3,3 | -0,2 |
| february | 4,4 | 6,8 | 2,4 |
| march | 8 | 8,5 | 0,5 |
| april | 12,3 | 13,3 | 1,0 |
| may | 17,5 | 20,4 | 2,9 |
| june | 19,9 | 23,1 | 3,2 |
| july | 22,1 | 23,1 | 1,0 |
| august | 22,2 | 22,6 | 0,4 |
| september | 17,9 | 23,1 | 5,2 |
| october | 13 | 12,6 | -0,4 |
| november | 7,5 | 7,6 | 0,1 |
| december | 4,6 | 6,7 | 2,1 |

**10 maximum values are upper than climatic values.**

## Comparison of 2016 and climatic maximum monthly averages for Ohmoor



**Station 3 : Helsingin minimum monthly 2016 and climatic average, difference between minimum 2016 and climatic averages.**

| Helsingin | minimal monthly climatic average °C | 2016 minimum monthly average °C | difference between 2016 minimum and climatic average |
|---|---|---|---|
| january | -8,5 | 1,1 | 9,6 |
| february | -9,3 | -1,2 | 8,1 |
| march | -5,6 | -1,3 | 4,3 |
| april | -0,7 | 1,9 | 2,6 |
| may | 4,4 | 8,7 | 4,3 |
| june | 9,3 | 11,5 | 2,2 |
| july | 11,8 | 14,6 | 2,8 |
| august | 10,7 | 13,4 | 2,7 |
| september | 6,1 | 9,4 | 3,3 |
| october | 2,2 | 3,5 | 1,3 |
| november | -2,4 | -2,3 | 0,1 |
| december | -6,6 | -2,2 | 4,4 |

**12 minimum values are upper than climatic values.**

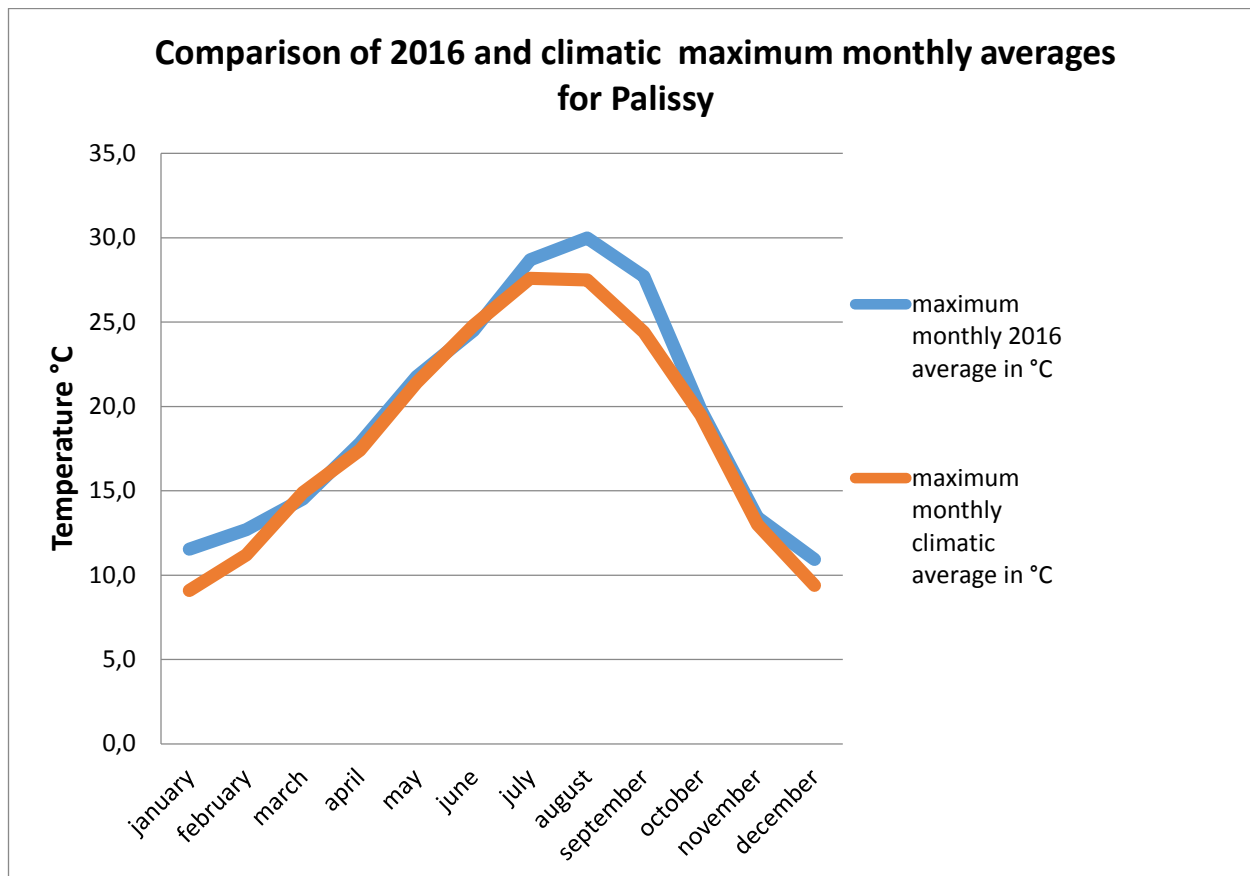**Comparison of 2016 and climatic minimum monthly averages for Helsingin**

**Station 3 : Helsingin maximum monthly 2016 and climatic average, difference between maximum 2016 and climatic averages.**

| Helsingin | maximum monthly climatic average °C | 2016 maximum monthly average °C | difference between maximum 2016 and climatic averages |
|---|---|---|---|
| january | -2,6 | 3,9 | 6,5 |
| february | -2,9 | 2,2 | 5,1 |
| march | 1,1 | 3,9 | 2,8 |
| april | 7,5 | 9,2 | 1,7 |
| may | 15,5 | 18,5 | 3,0 |
| june | 19,8 | 19,5 | -0,3 |
| july | 21,8 | 21,7 | -0,1 |
| august | 19,9 | 19,3 | -0,6 |
| september | 14 | 17,4 | 3,4 |
| october | 8,1 | 8,3 | 0,2 |
| november | 2,5 | 2,1 | -0,4 |
| december | -0,8 | 2,3 | 3,1 |

**8 maximum values are upper than climatic values.**

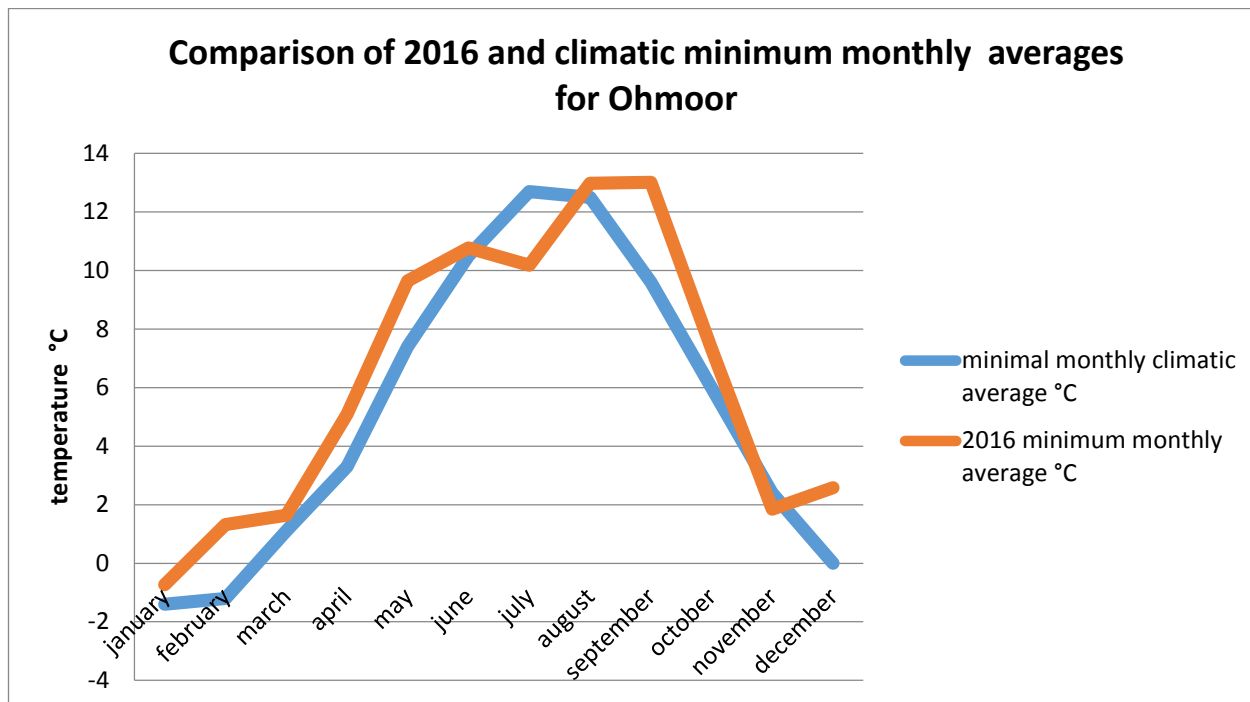## Comparison of 2016 and climatic maximum monthly averages for Helsingin
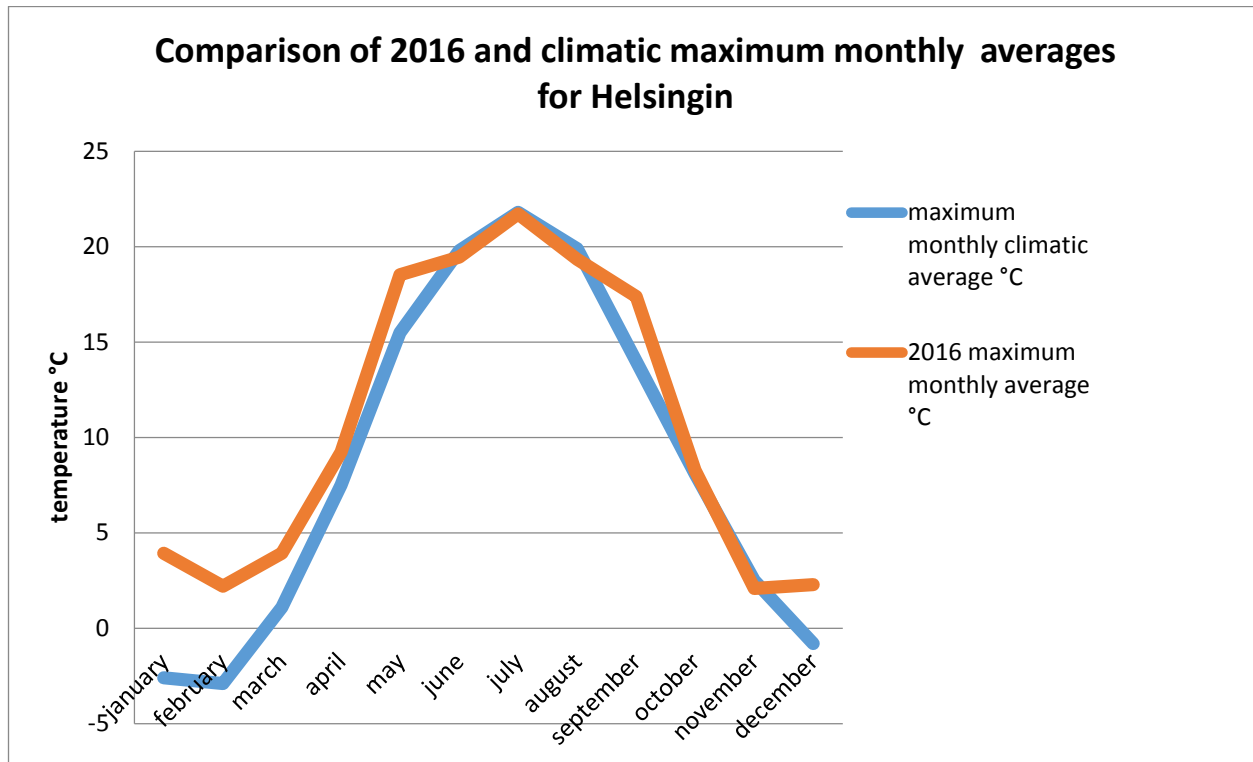


**Station 4 : Utajarven minimum monthly 2016 and climatic average, difference between minimum 2016 and climatic averages.**

| Utajarven | minimal monthly climatic average °C | 2016 minimum monthly average °C | difference between 2016 minimum and climatic average |
|---|---|---|---|
| january | -15,4 | -16,4 | -1,0 |
| february | -14,7 | -5,4 | 9,3 |
| march | -10,1 | -4,4 | 5,7 |
| april | -3,4 | 0,4 | 3,8 |
| may | 2,8 | 6,4 | 3,6 |
| june | 8,8 | 10,3 | 1,5 |
| july | 11,4 | 13,0 | 1,6 |
| august | 9,5 | 10,5 | 1,0 |
| september | 4,9 | 6,7 | 1,8 |
| october | 0,3 | 1,2 | 0,9 |
| november | -5,9 | -6,1 | -0,2 |
| december | -12,1 | -9,1 | 3,0 |

**10 minimum values are upper than climatic values.**

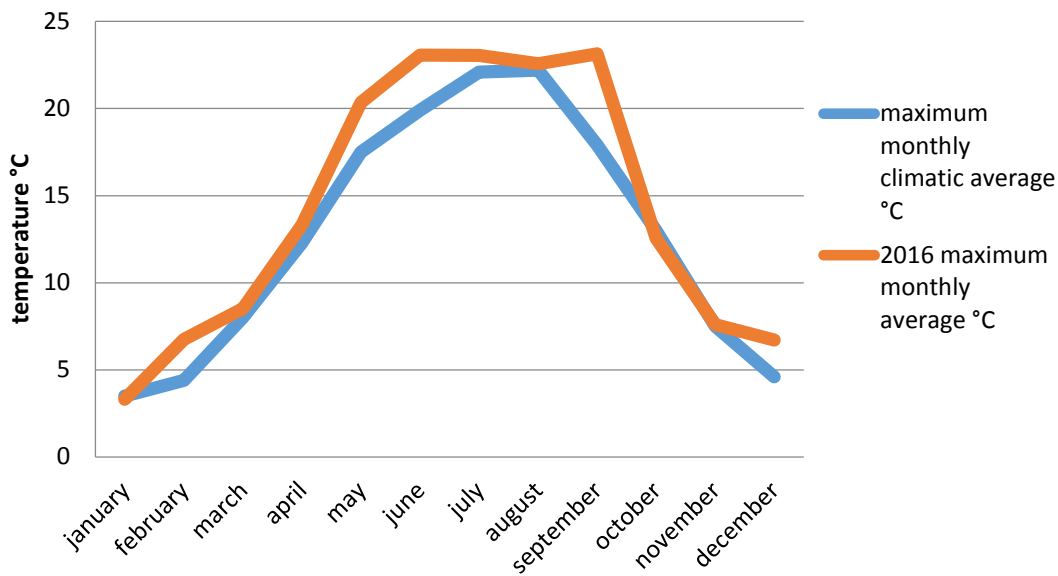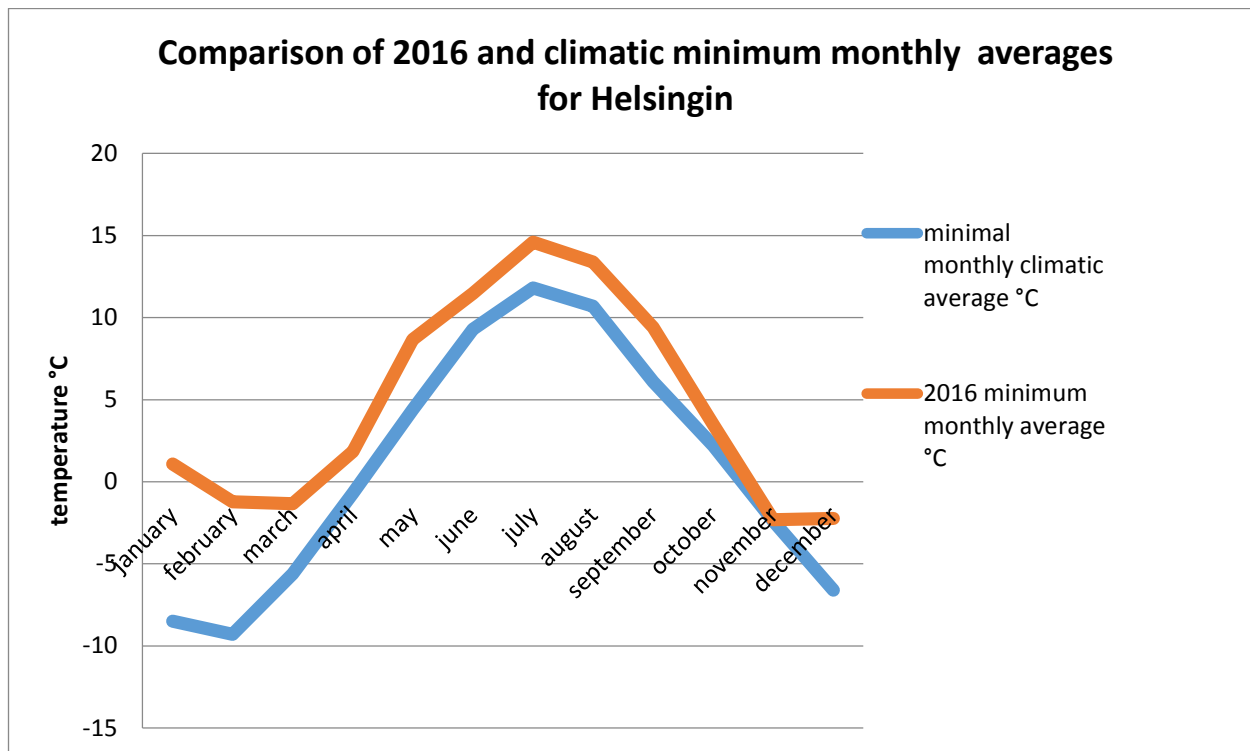**Comparison of 2016 and climatic minimum monthly averages for Utajarven**
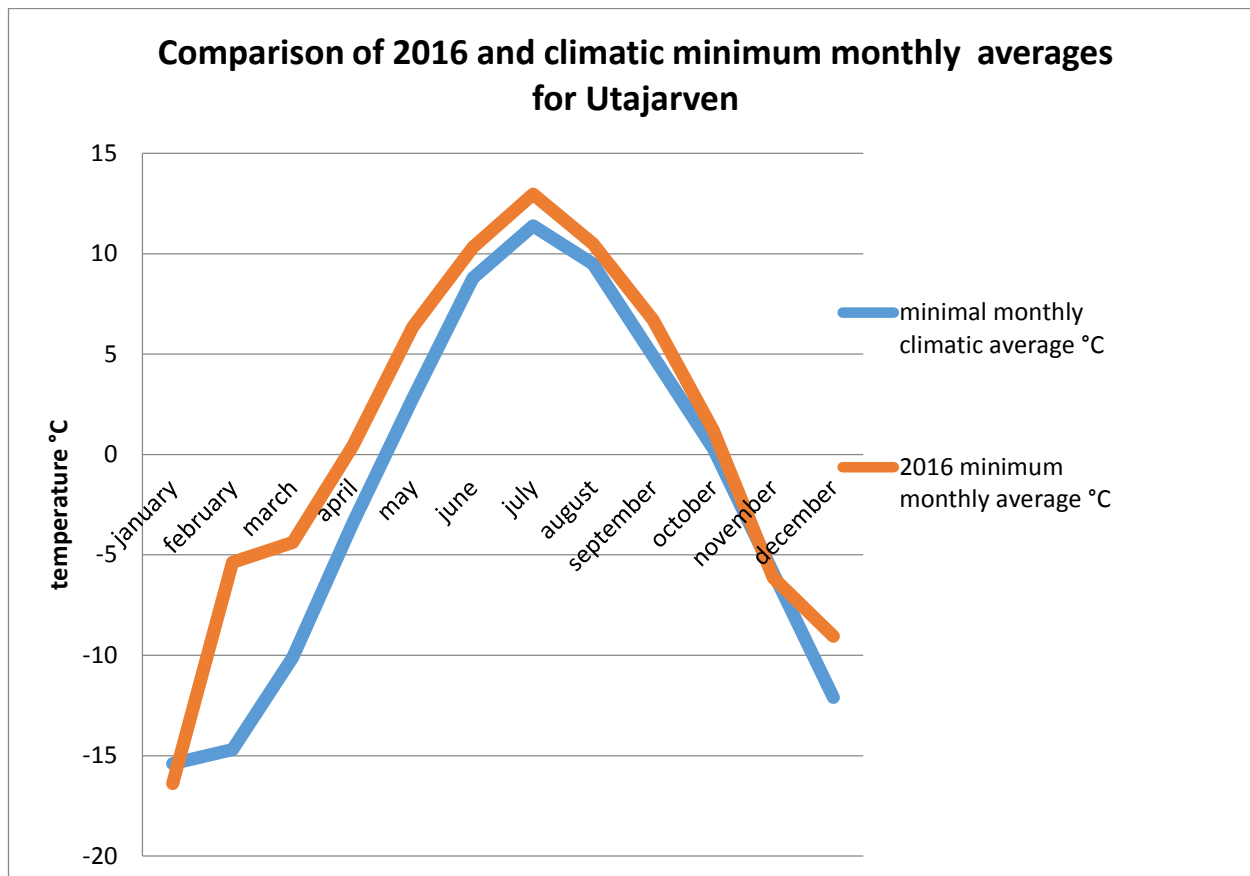
**Station 4 : Utajarven maximum monthly 2016 and climatic average, difference between maximum 2016 and climatic averages.**

| Utajarven | maximum monthly climatic average °C | 2016 maximum monthly average °C | difference between maximum 2016 and climatic averages |
|-----------|-------------------------------------|--------------------------------|-------------------------------------------------------|
| january | -7,4 | -9,4 | -2,0 |
| february | -6,8 | -1,2 | 5,6 |
| march | -1,7 | 2,2 | 3,9 |
| april | 4,5 | 8,0 | 3,5 |
| may | 12,2 | 18,3 | 6,1 |
| june | 17,9 | 20,3 | 2,4 |
| july | 20,4 | 23,9 | 3,5 |
| august | 17,8 | 18,7 | 0,9 |
| september | 11,9 | 14,2 | 2,3 |
| october | 5,5 | 5,9 | 0,4 |
| november | -0,6 | -1,2 | -0,6 |
| december | -4,9 | -1,8 | 3,1 |

**10 maximum values are upper than climatic values.**
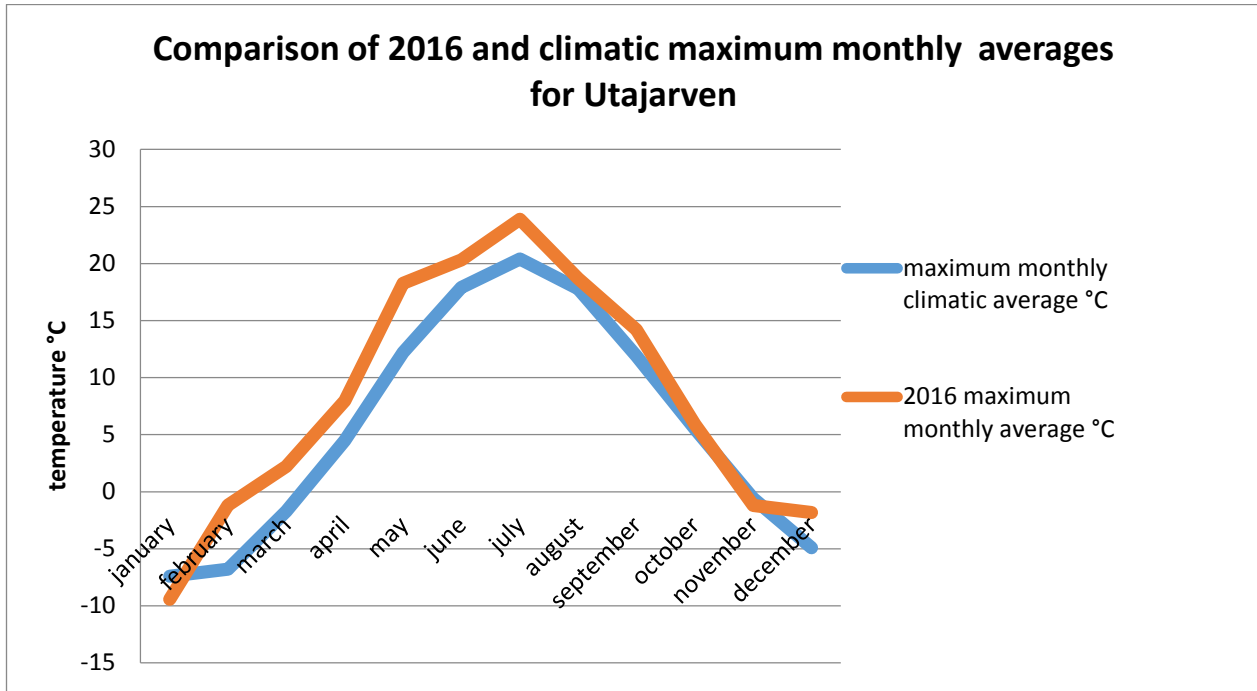
## Comparison of 2016 and climatic maximum monthly averages for Utajarven



| Synthesis : | Utajarven 65°N | Helsingin 60°N | Ohmoor 53°N | Palissy 43°N | Overall percentage |
|---|---|---|---|---|---|
| **Number of values greater than 0 for min AND max** | 20 | 20 | 20 | 20 | **83,3** |

## Analysis :

**For global warming, we have 80/96 averages of 2016 (83%) upper than climatic values.**

**Global warming is present in all stations (20/24) and this shows that the rise in temperature is global.**

**For the year 2016 more than 80 % of the data shows global warming.**

**The first hypothesis is confirmed by the results.**

**Second goal : is global warming more important on the minimum monthly averages than on the maximum ?**

**Station 1 : Palissy**

| Palissy 43 | difference between minimum monthly 2016 average and minimum monthly climatic averages in °C | difference between maximum monthly 2016 average and maximum monthly climatic averages in °C | difference between the minimum deviation and the maximum deviation in °C |
|---|---|---|---|
| january | 3,6 | 2,4 | 1,2 |
| february | 2,6 | 1,5 | 1,1 |
| march | 1,0 | -0,4 | 1,4 |
| april | 2,1 | 0,4 | 1,7 |
| may | 1,2 | 0,4 | 0,8 |
| june | 1,7 | -0,3 | 2,0 |
| july | 1,6 | 1,1 | 0,5 |
| august | 1,4 | 2,5 | -1,1 |
| september | 3,0 | 3,3 | -0,3 |
| october | 0,0 | 0,3 | -0,3 |
| november | 1,8 | 0,4 | 1,4 |
| december | 0,0 | 1,5 | -1,5 |



difference between the minimum deviation and the maximum deviation in °C
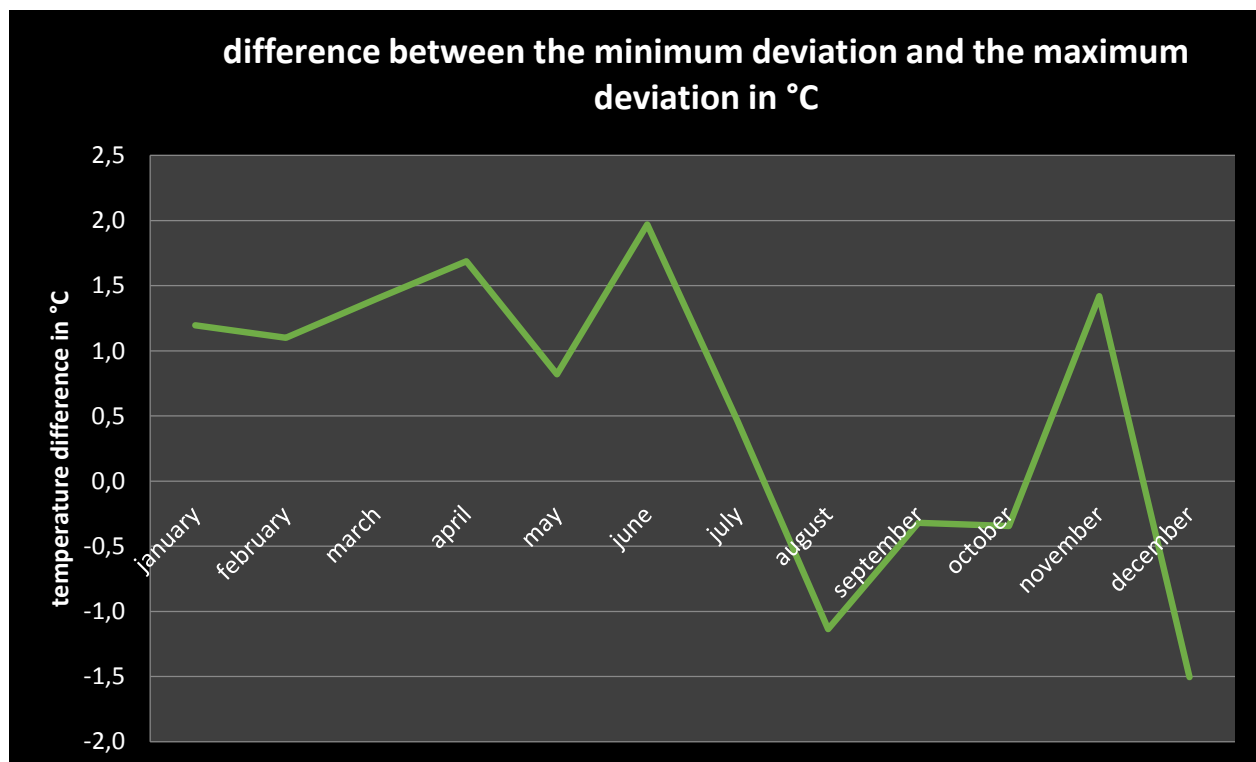
**8/12 deviation values are positive.**

**Station 2 : Ohmoor**

| Ohmoor 53 | difference between minimum monthly 2016 average and minimum monthly climatic averages in °C | difference between maximum monthly 2016 average and maximum monthly climatic averages in °C | difference between the minimum deviation and the maximum deviation in °C |
|---|---|---|---|
| january | 0,7 | -0,2 | 0,9 |
| february | 2,5 | 2,4 | 0,2 |
| march | 0,5 | 0,5 | 0,0 |
| april | 1,8 | 1,0 | 0,8 |
| may | 2,2 | 2,9 | -0,6 |
| june | 0,3 | 3,2 | -2,9 |
| july | -2,5 | 1,0 | -3,5 |
| august | 0,5 | 0,4 | 0,1 |
| september | 3,4 | 5,2 | -1,8 |
| october | 1,3 | -0,4 | 1,8 |
| november | -0,5 | 0,1 | -0,6 |
| december | 2,6 | 2,1 | 0,5 |
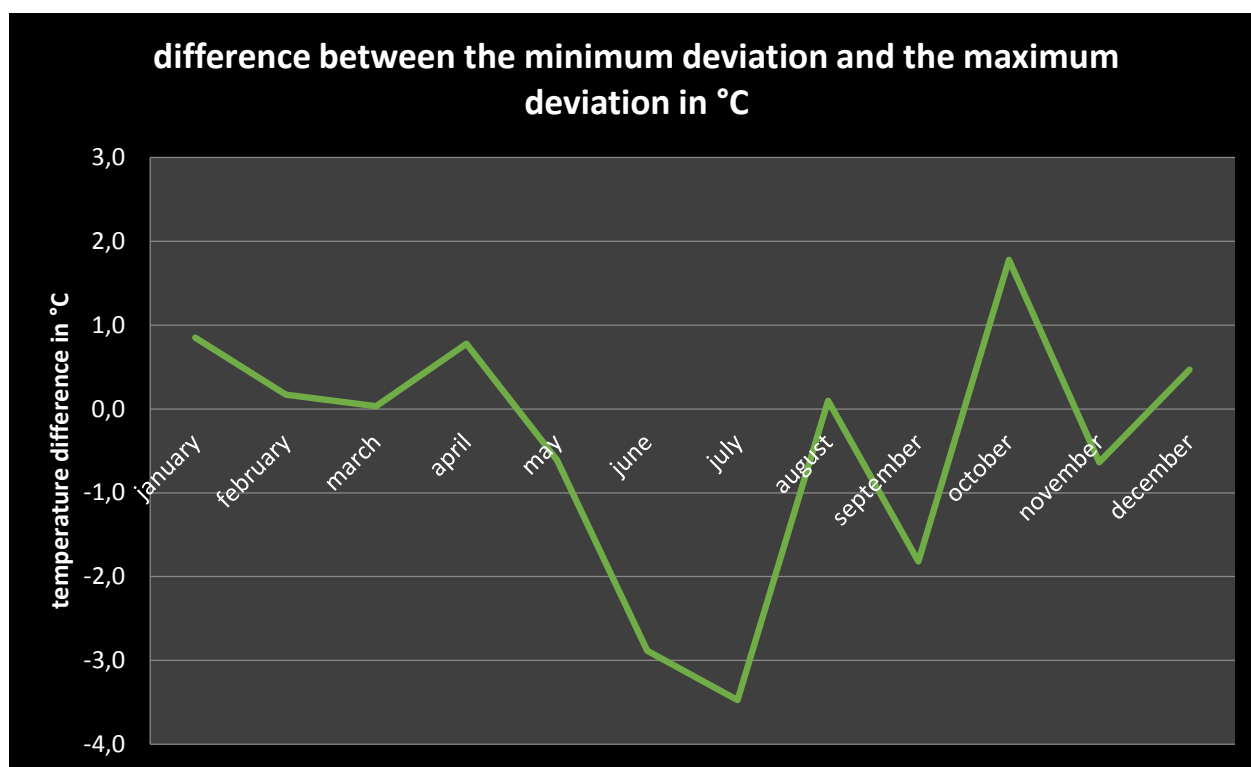


**6/12 deviation values are positive.**

**Station 3 : Helsingin**

| Helsingin 60 | difference between minimum monthly 2016 average and minimum monthly climatic averages in °C | difference between maximum monthly 2016 average and maximum monthly climatic averages in °C | difference between the minimum deviation and the maximum deviation in °C |
|---|---|---|---|
| january | 9,6 | 6,5 | 3,0 |
| february | 8,1 | 5,1 | 3,0 |
| march | 4,3 | 2,8 | 1,4 |
| april | 2,6 | 1,7 | 0,8 |
| may | 4,3 | 3,0 | 1,2 |
| june | 2,2 | -0,3 | 2,5 |
| july | 2,8 | -0,1 | 2,9 |
| august | 2,7 | -0,6 | 3,2 |
| september | 3,3 | 3,4 | -0,1 |
| october | 1,3 | 0,2 | 1,1 |
| november | 0,1 | -0,4 | 0,5 |
| december | 4,4 | 3,1 | 1,3 |



difference between the minimum deviation and the maximum deviation in °C

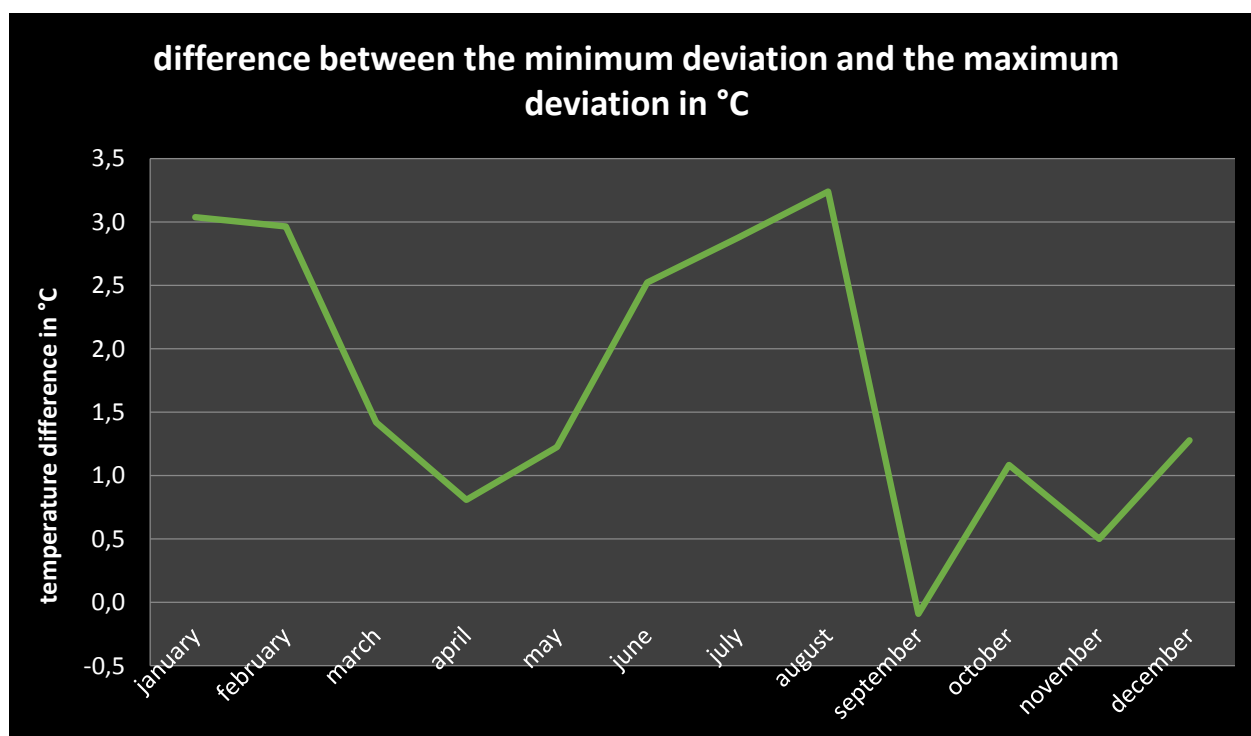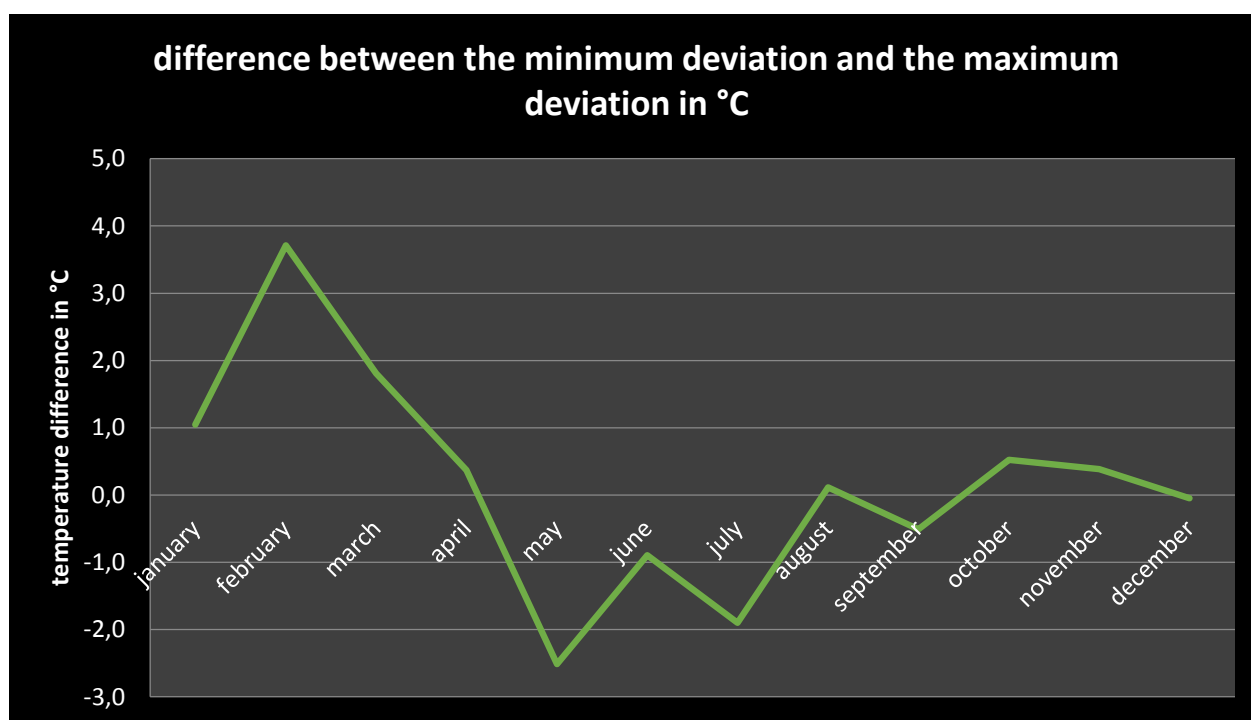**11/12 deviation values are positive.**

**Station 4 : Utajarven**

| Utajarven 65 | difference between minimum monthly 2016 average and minimum monthly climatic averages in °C | difference between maximum monthly 2016 average and maximum monthly climatic averages in °C | difference between the minimum deviation and the maximum deviation in °C |
|---|---|---|---|
| january | -1,0 | -2,0 | 1,0 |
| february | 9,3 | 5,6 | 3,7 |
| march | 5,7 | 3,9 | 1,8 |
| april | 3,8 | 3,5 | 0,4 |
| may | 3,6 | 6,1 | -2,5 |
| june | 1,5 | 2,4 | -0,9 |
| july | 1,6 | 3,5 | -1,9 |
| august | 1,0 | 0,9 | 0,1 |
| september | 1,8 | 2,3 | -0,5 |
| october | 0,9 | 0,4 | 0,5 |
| november | -0,2 | -0,6 | 0,4 |
| december | 3,0 | 3,1 | 0,0 |



difference between the minimum deviation and the maximum deviation in °C

**7/12 deviation values are positive.**

| Synthesis : | Utajarven 65°N | Helsingin 60°N | Ohmoor 53°N | Palissy 43°N | Overall percentage |
|---|---|---|---|---|---|
| Number of values greater than 0 | 7 | 11 | 6 | 8 | 66,6 |

**Analysis :**

For the deviations between maxima and minima, 32/48 minima deviations are upper than maxima deviations (66, 6%).
If the calculated value is positive it will mean that global warming is more important for the minima than for the maxima.
This is not a strong correlation but a certain trend that shows that global warming is marked by a greater increase in minimums than maxima.

It can be noted that in absolute values, warming is much higher for high latitudes than for medium latitudes.
If average deviations are made (by aggregating maximum and minimum deviations and then averaging), average warming of 5.4 ° C is founded for high latitudes and mean warming of 2.7 °C for average latitudes.
This is consistent with the IPCC projections for higher warming at high latitudes than for mid latitudes.

The second hypothesis is partially confirmed by the results on a european scale.

The most "surprising" thing in the results obtained is that the differences between the climate data and the yearly data (2016) are very important. The scientific literature tells us that the overall increase over the past 150 years is 0.74 ° C, and 1.3°C for the minimum on a French scale. The gap clearly shows the variations between climate and meteorology.

**Discussion :**

The data from the GLOBE stations are not all complete, some days are missing and this must change the average.
The choice of stations was difficult and we tried to use semi-professional weather station.
The expected results partly confirm the hypothesis even if the sample is weak (4 stations only).

**Conclusion :**

Simple comparisons with GLOBE data show that global warming is a global phenomenon. This heating is more important for the minimum temperatures than for the maximum temperatures.
This little work makes it possible to become aware of global warming and can be done in each school.
To improve accuracy it would be necessary to do this research with more stations, in different continents and over several years.

**Bibliography – sources :**

Page 1 : https://ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full.pdf   page 28

Page 2 : www.opcc-ctp.org/etudes/memoire_M2_CDUQUESNE.pdf page 10

2016 raw data on GLOBE :

Palissy : lycée Bernard Palissy site : grande-Cour ATM-01
Gymnasium Ohmoor : site : School Location Sachsenweg 76:ATM-01

Helsingin yliopiston Viikin normaalikoulu site : Viikin normaalikoulu
Utajarven Ylaaste : site Atmosphere: ATM-02

Climatic data :

Palissy : http://www.meteofrance.com/climat/france/agen/47091001/normales
Gymnasium Ohmoor (Hamburg) http://worldweather.wmo.int/fr/city.html?cityId=55
Helsingin yliopiston Viikin normaalikoulu http://worldweather.wmo.int/fr/city.html?cityId=168
Utajarven Ylaaste (nearest station,Oulu) :
http://www.climatedata.eu/climate.php?loc=fixx0013&lang=en

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