

# Temperature data management

May 2007

We calculated monthly mean values for every year and for the whole 30 year period using daily data purchased from FMI to be used in GIS courses of Departments of Biological and Environmental Sciences and Forest Resource Management, University of Helsinki. We believe that calculations are correct, but still use in your own responsibility. Calculations were made by Eduardo Gonzalez (email: eglatorre@gmail.com).

The original data contains information for the whole Finland (grid) for every day in the period 1971 through 2000. Coordinates are in Finland zone 3-system (YKJ ), values present the center point of the cell. A small program was created to calculate the following parameters from the data:

Temperature statistics for the 30 year period were calculated, for each month:

- average of the 30 years month average temperatures
- average of the 30 years month minimum temperatures
- minimum of the 30 years month minimum temperatures
- average of the 30 years month maximum temperatures
- maximum of the 30 years month maximum temperatures

## Statistics definition

A short explanation on the way the calculations were done to get statistics can be found below. All the following is calculated for every point in the grid covering Finland.

### **Average of the 30 years month average temperatures**

The average for each month is calculated data using the daily data, for every year. This way we have 30 different average temperatures for every month. What gives us the parameter we are looking for is finally just calculate the average of those 30 values for each month separately.

### **Average of the 30 years month minimum temperatures**

In a similar way the program calculates the absolute minimum temperature for every month using the daily data. We finally have 30 different absolute minimum temperature values for every month. Finally, we just calculate the average of those minimum temperatures so we get one average absolute minimum temperature (over 30 years) for every month.

### **Minimum of the 30 years month minimum temperatures**

All the minimum temperatures for every month during the 30 years period are compared and the smallest value is taken as the absolute minimum temperature of that month for that period.

### **Average of the 30 years month maximum temperatures**

As with the average minimum temperature, the program calculates the absolute maximum temperature for every month using the daily data. We finally have 30 different absolute maximum temperature values for every month. Finally, we just calculate the average of those maximum temperatures so we get one average absolute maximum temperature (over 30 years) for every month.

### **Maximum of the 30 years month maximum temperatures**

All the maximum temperatures for every month during the 30 years period are compared and the highest value is taken as the absolute maximum temperature of that month for that period.

An example of the column names for the month of January will help understand the structure of the result table. Of course the result file contains the coordinates of the grid point in the two first columns of the table. The result file does start with a header line as the following one, only it will contain similar columns for the rest of the months (only January in the example):

X            Y            JanAvg   JanAvgMin   JanAvgMax   JanMinMin   JanMaxMax

- JanAvg: average of the 30 years January average temperatures
- JanAvgMin: average of the 30 years January minimum temperatures
- JanMinMin: minimum of the 30 years January minimum temperatures
- JanAvgMax: average of the 30 years January maximum temperatures
- JanMaxMax: maximum of the 30 years January maximum temperatures