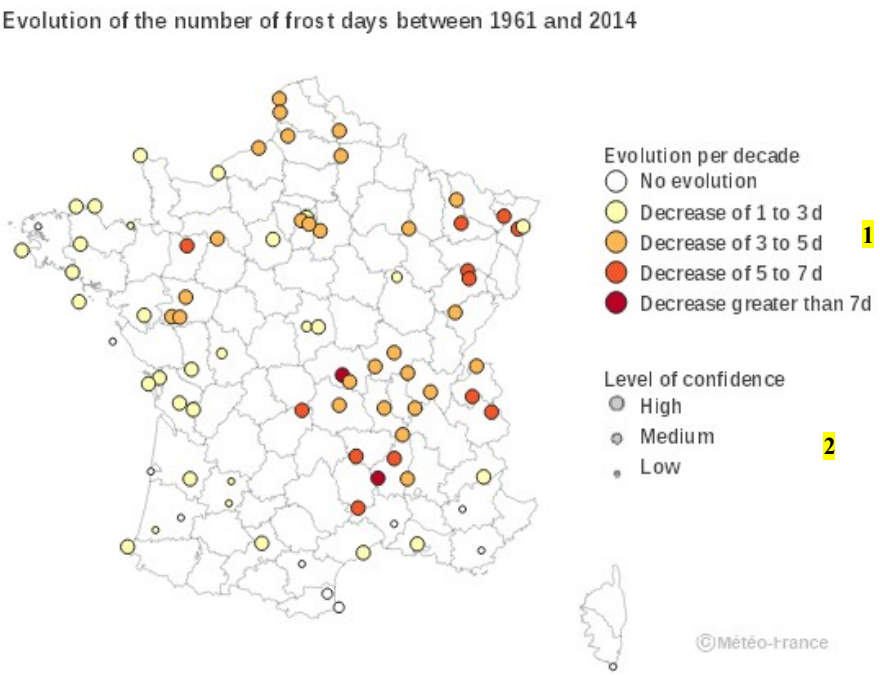
Evolution of the number of days of frost
Past climate – Metropolitan France

1. Graph reading aid



This map represents the evolution of the number of frost days during the period 1961 – 2014.
Each coloured dot shows the location of a selected weather observation station.

1 Colour of symbols: for every daily reference series (cf § 3 Data and methods), trends were able to be calculated : a dot is plotted in yellow to red when the trend shows a decrease in the number of frost days.

2 Size of symbols: the size of the symbol represents the level of confidence of the estimated trend, based on a statistical test (cf § 3 Data and methods).

Published on July 18, 2023

2. Definitions

Daily minimum temperature (TNq): minimum temperature observed between J-1 at 18:00 UTC and J at 18:00 UTC.

Day of frost: day during the course of which the daily minimum temperature is inferior or equal to 0°C (TNq ≤ 0°C).

3. Data and methods

Homogenised sequences:

The sequences of measures are not immediately usable for the analysis of climate evolutions. They are affected by changes in measurement conditions over the course of time, such as alterations in the position of the measuring station, or sensor changes. These changes cause biases, which can be in the same order of magnitude as the climatic signal. Homogenisation is a statistical treatment the aim of which is to detect and correct biases in the raw sequences, so as to produce adapted reference sequences for quantifying climate change.

Reference daily sequences:

Homogenisation applies to sequences of monthly averages. Homogenised sequences do not therefore allow the analysis of the evolution of daily extremes, such as for example the number of days when the temperature exceeded a certain threshold. The daily reference sequences are sequences of measures which are not corrected, but which have been selected for their quality, by using in partticular the results of the homogenisation. They can start later than the homogenised sequences, if they do not satisfy quality criteria at the beginning of the period.
Between 2 and 4 reference daily sequences were selected for each metropolitan administrative region, following the criteria of availability, quality and representativeness.

For every daily reference sequences, the evolution between 1961 – 2014 is evaluated using a linear trend, and a statistical test is applied (Mann-Kendall test) to estimate the confidence level associated with this evolution.

4. References

Évolution de la température en France depuis les années 1950 : constitution d'un nouveau jeu de séries homogénéisées
Gibelin Anne-Laure; Dubuisson Brigitte; Corre Lola; Deaux Nathalie; Jourdain Sylvie; Laval Laurence; Piquemal Jean-Michel; Mestre Olivier; Dennetière Denis; Desmidt Stéphanie; Tamburini Agnès, 2014, La Météorologie 87

Évolution des valeurs extrêmes de température et de précipitations au cours du XX^{e} siècle en France
Moisselin J.-M., Dubuisson B., 2006, *La Météorologie* 54, 33-42

ONERC : Observatoire National sur les Effets du Réchauffement Climatique
https://www.ecologique-solidaire.gouv.fr/observatoire-national-sur-effets-du-rechauffement-climatique-onerc

Published on July 18, 2023