Evolution of cooling degrees-day
Past climate

1. Graph reading aid

Annual cooling degrees-day
Cannes
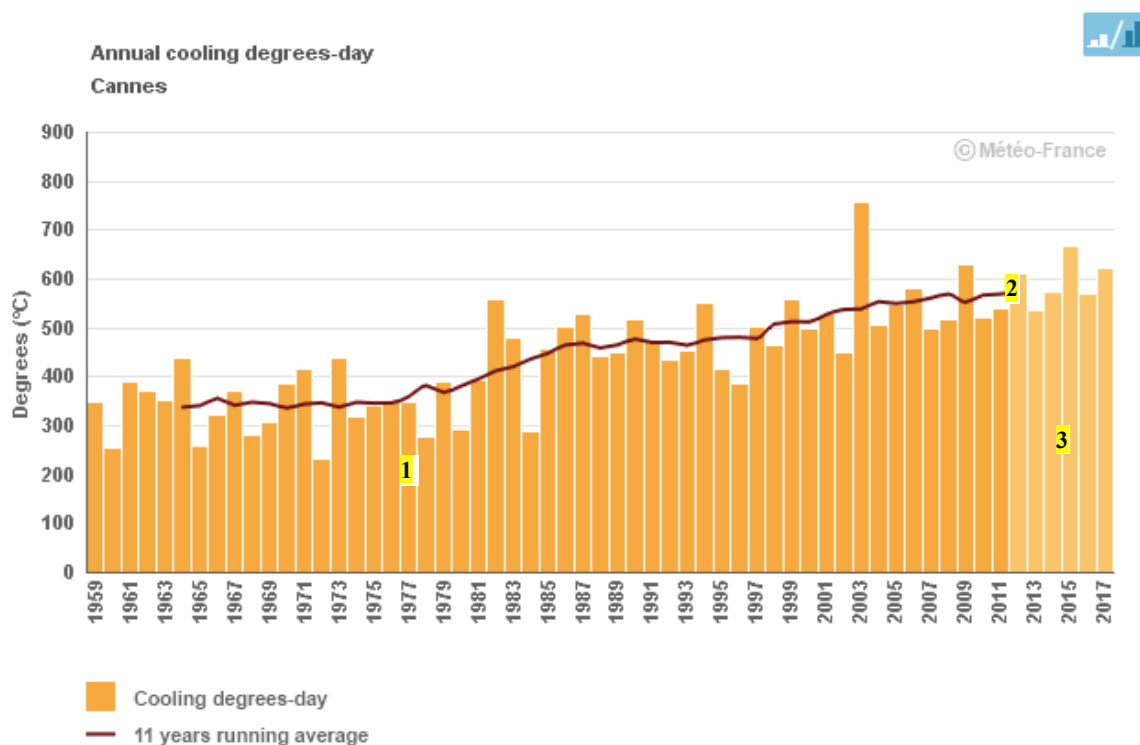
3 data sequences are shown in the graph:

Sequence 1 'histogram in yellow':
The cooling degree-day indicator allows to evaluate the air-conditioning energy consumption.
For each year is calculated the degrees-day amount by cooling method (cf §2 Definitions) from *homogenised data* (cf § 3. Data and methods)

Sequence 2 'curve in ochre':
11 year moving average of the parameter represented in the form of a histogram. Due to the moving average which is centred on the year concerned, there is no value for the first 5 years of the sequence, nor for the last 5.

Sequence 3 'histogram in 'paler' yellow:
 For each year is calculated the degrees-day amount by cooling method (cf. §2 Definitions) *from non homogenised data* (non homogenised sequences, cf. § 3. Data and methods).

Missing data: If the sequence includes missing data at the beginning of the period, the corresponding area appears as 'shaded'.

2. Definitions

Cooling degree-day: (TMq – 18) si TMq $> 18°C$

Minimum/maximum/average temperatures:

- o Daily minimum temperature (TNq) = minimum temperature observed between J-1 at 18:00 UTC and J at 18:00 UTC
- o Daily maximum temperature (TXq) = maximum temperature observed between J at 06:00 UTC and J+1 at 06:00 UTC
- o Daily average temperature (TMq) = (TNq + TXq)/2

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 breaks, which can be in the same order of magnitude as the climate signal. Homogenisation is a statistical treatment the aim of which is to detect and correct breaks in the raw sequences, so as to produce reference sequences adapted for quantifying climate change.

Homogenised sequences are produced for a precise period, for example that of 1955-2010. In the graph, they are prolonged until a more recent date by raw data, represented by a paler colour. If they begin after 1959, the graph is shaded for the beginning years.

There are in metropolitan France 228 monthly homogenised minimum temperature sequences and 251 monthly maximum temperature sequences.

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

Homogénéisation transfrontalière des températures sur le massif des Pyrénées
Deaux Nathalie, Soubeyroux Jean-Michel, Cuadrat José M., Cunillera Jordi, Esteban Pere, Prohom Marc, Serrano Notivoli Roberto, 2014, XXXVII colloque de l'AIC, Dijon, France, 2-5 juillet 2014, 344-350.

HOMER: a homogenization software – methods and applications. Idojaras, Quarterly journal of the Hungarian Meteorological Service, 117, no. 1, 2013.
Mestre, O., P. Domonkos, F. Picard, I. Auer, S. Robin, E. Lebarbier, R. Böhm, E. Aguilar, J. Guijarro, G. Vertachnik, M. Klancar, B. Dubuisson, and P. Stepanek: