Geophysical Research Abstracts, Vol. 8, 09142, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09142

On the need of a changing threshold in heat wave definition

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Heat waves are extreme events with an important impact on human activities and mortality which, nevertheless, have not a standard definition; see for example, Kysely (2000), Robinson (2001) or Díaz (2002). The usual way to define a heat wave is to consider an absolute or relative threshold for a temperature related variable, often the daily maximum air temperature, and to define the heat wave as the period where the values of this variable exceed the threshold.

Usually a constant threshold is considered during all the summer and over time, although it is a common assertion that heat waves occurring at the beginning of the summer have more impact on mortality. It can be due to the fact that the same value of the threshold is more severe at the beginning of the summer than afterwards; this fact leads to the need of a changing heat wave threshold, as the Indian Meteorological Department, for example, does. This kind of threshold would take into account the ability of people for adapting to increasing temperatures.

The aim of this work is to show that a changing threshold is necessary if we want to obtain indeed an homogeneous heat wave definition and to propose a procedure to obtain this threshold. We illustrate its use with the application to three Spanish locations, Zaragoza, Madrid and Barcelona, using the daily temperature and mortality data of people 65 or more years old.

References

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