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## Scientists compiled 20th century temperature data in Spain as evidence of climatic change

***This release is available in [Spanish](#).***

This research work is the first step to confirm the existence of a temperature change. Their main goal has been "to detect the signs of the Climatic Change through the temperatures in Spain", explained to SINC the researcher of the [department of Applied Physics](#) of the University of Granada and main author, **Matthias Staudt**.

The compilation of maximum and minimum temperature series of every month since the end of the 19th century until the beginning of the 21st century has not always been an easy task. The data, which have been collected in 45 Spanish observatories, were not "homogeneous" in every case. In climatology, a series of data (temporary series) is considered as homogeneous when its content reflects exclusively the climatic evolution (this is, when the different indexed factors are absent). Therefore, the researchers' work has mainly consisted in removing inhomogeneous "pollution" in data.

According to the scientist, analysing the quality of the data –which were published in November in the International Journal of Climatology- becomes, the "best method to believe in the final results". "Technical preparation is essential to take the second step and do research into the rise of temperature at an unquestionable statistical level", he added.

### Data homogeneization

Changing a thermometer which has been calibrated in a different way is one of the factors why temperature data usually present incoherencies. In addition, the different reading interpretations of a human being or the frequent location changes of the observatories (changes from a urban environment to an airport, altitude changes, etc.) are problems with which the scientific team has had to deal with."

Moving a thermometer without recording this fact gives rise to a very strange result which can not be explained 50 years later", explained Staudt. Besides this, there are human typographical errors which present "non-homogeneous" data.

Scientists have been working for five years to find out, evaluate and repair the data series. "In order to make them as reliable as possible without converting them into a pretext for those reluctant to admit the existence of the Climatic Change", explained the researcher. Although he admits that he has not obtained absolute conclusions, he has managed to establish a "normality" criterion in the behaviour of temperatures. "With a high level of probability, a qualitative decrease of seven degrees from April to May is not normal, as there should be a rise in any case", he said.

Due to the homogeneization problems specified in the analysed monthly series, the researchers have set themselves a very strict "detection of un-homogeneities" criterion. Despite this, the instrumental error in a temperature measurement is in the order of 0.1°C, and the error of a difference between data, previously treated with the homogeneization method, rises to the order of 0.4°C. This error is not negligible but anyway it is "considerably smaller than the gross data".

To come to conclusions that confirm climatic change in Spain, at a high level of reliability, this technical work involves a "necessary and obvious effort". Staudt said that "the results obtained about the Climatic Change are not new, but they will confirm what we (almost) already knew".

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M, Staudt, M.J. Esteban-Parra, Y. Castro-Diez. "Homogenization of long-term monthly Spanish temperature data", International Journal of Climatology 27 (13): 1809-1823 Nov.15 2007.

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