Geophysical Research Abstracts
Vol. 14, EGU2012-956-1, 2012
EGU General Assembly 2012

Investigation of methods for hydroclimatic data homogenization

E. Steirou and D. Koutsoyiannis
National Technical University of Athens, Greece (evasteirou@hotmail.com)

We investigate the methods used for the adjustment of inhomogeneities of temperature time series covering the last 100 years. Based on a systematic study of scientific literature, we classify and evaluate the observed inhomogeneities in historical and modern time series, as well as their adjustment methods. It turns out that these methods are mainly statistical, not well justified by experiments and are rarely supported by metadata. In many of the cases studied the proposed corrections are not even statistically significant.
From the global database GHCN-Monthly Version 2, we examine all stations containing both raw and adjusted data that satisfy certain criteria of continuity and distribution over the globe. In the United States of America, because of the large number of available stations, stations were chosen after a suitable sampling. In total we analyzed 181 stations globally. For these stations we calculated the differences between the adjusted and non-adjusted linear 100-year trends. It was found that in the two thirds of the cases, the homogenization procedure increased the positive or decreased the negative temperature trends.
One of the most common homogenization methods, 'SNHT for single shifts', was applied to synthetic time series with selected statistical characteristics, occasionally with offsets. The method was satisfactory when applied to independent data normally distributed, but not in data with long-term persistence.
The above results cast some doubts in the use of homogenization procedures and tend to indicate that the global temperature increase during the last century is between 0.4°C and 0.7°C, where these two values are the estimates derived from raw and adjusted data, respectively.