HOMER and ACMANT comparison methods for central Pyrenees temperature

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The global warming projected to the 21th century by all emission scenarios is larger than the global temperature changes were in the previous centuries. Recent reports of the Intergovernmental Panel on Climate Change indicate that the Mediterranean region is one of the most vulnerable areas of the Earth to the global warming. Therefore it is essentially important to learn and understand more precisely the climate and climate change of the Mediterranean and pre-Mediterranean areas. The present study aims to reveal the temporal evolution of the thermal climate for the central Pyrenees region in the last 100 years more accurately than in previous works.

Observed temperature time series of the Spanish Pyrenees area have been collected from the Spanish Meteorological Agency and Catalan Meteorological Service. This data base consists of 123 series of either automatic or mechanical observations. The series are various long and they cover various sections of the period 1911 – 2013. The time series have been quality controlled and homogenized. For quality control, the software ExtraQC (incorporated in RClimdex package) was applied to identify and correct non-systematic errors. Then, each series of at least 30 year length was tested for homogeneity. Two modern, multiple break homogenization methods were applied, namely HOMER and ACMANT. Both methods had been developed during the Action COST-ES0601 (HOME). While ACMANT is fully automatic, and thus it is convenient to use it for large datasets, HOMER has the advantage that it allows manual control when documental evidences of technical changes (metadata) are available.

The results show that observed temperature series are generally inhomogeneous, therefore their homogenization is important before their use for climate variability and climate impact studies. The found biases by HOMER and ACMANT are mostly similar, although some differences need further examinations.