Homogenized observations and reconstructed datasets: how well do they compare?

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Abstract
Climate assessments focusing on a very broad range of subjects require high-quality ground based climatological measurements, especially in sparse instrumental covered regions with high temporal and spatial variability, such as the Peruvian Andes. In particular, as a part of the quality control procedure of such observations, non-climatic signals in the data should be removed based on the documented history of the stations and further statistical analyses. Homogenized temperature data from the Cuzco and Junín regions in the Peruvian Andes, most of them covering the last 50 years, have been produced in the framework of the CLIMANDES project. CLIMANDES is a joint project between the Meteorological and Hydrological Service of Peru (SENAMHI) and the Swiss Federal Office of Meteorology and Climatology MeteoSwiss, with support from Meteodat GmbH.

As a following research step, ongoing efforts aim to put the information obtained from the homogenized station data in a broader regional context. For that, we extract information from reconstructed datasets, such as reanalyses, and explore the way our homogenized data compare with them in terms of biases, amplitude, variability, and trends. On the one hand, we estimate the climatological plausibility of the homogenized values considering the reconstructed datasets as references. On the other hand, we assess the performance of the said reconstructed datasets using the homogenized measurements as local benchmarks. Finally, some main discussions and guidelines are offered regarding the future use of our homogenized observations and the reconstructed datasets for climate studies in the region.