



Continental scale temperature variability as simulated in the PMIP3 simulation ensemble compared to PAGES 2K temperature reconstructions

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Model results and proxy-based reconstructions have been used jointly over the last several decades to improve our knowledge of climate variability and change over the Common Era. Here we take advantage of the recent set of continental-scale temperature reconstructions generated by the PAGES2K project and the collection of state-of-the-art model simulations driven by external forcings in the framework of PMIP3. The first aim is to analyze the consistency between model results and reconstructions using a wide range of techniques. We study each region separately to determine whether the reconstructed and simulated time series have similar characteristics in terms of the magnitude and timing of the observed changes as well as the frequency distribution of the variability. The links between the regions are subsequently investigated to determine whether the analyzed patterns are similar in the reconstructions and in the simulations. The second aim is to assess the role of external forcings in the observed variations. One of our major conclusions is that model results display a larger inter-regional coherence in their spatial distribution of temperature changes compared to reconstructions. A second major result is that the impact of the forcing on the climate system is better detectable in the Northern Hemisphere regions, in particular over the period 1350-1850, than the Southern Hemisphere regions.