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Western Europe is warming much faster than expected

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The warming trend of the last decades is now so strong that it is discernible in local temperature observations. This opens the possibility to compare the trend to the warming predicted by climate models, which up to now could not be verified directly to observations on a local scale, because the signal-to-noise ratio was too low. The observed temperature trend in western Europe over the last decades appears much stronger than simulated by the CMIP3 ensemble, a UKMO perturbed physics ensembles, and ENSEMBLES RCM ensembles. The differences between the observed trends and the ones simulated by these four multi-model ensembles are very unlikely due to random fluctuations, either in fast weather processes or in decadal climate fluctuations.

In winter and spring, changes in atmospheric circulation are important; in spring and summer changes in soil moisture and cloud cover. A misrepresentation of the North Atlantic Current affects trends along the coast. Many of these processes continue to affect trends in projections for the 21st century. This implies that climate predictions for western Europe that are based on these models probably underestimate the effects of anthropogenic climate change.