

New reconstruction of Antarctic near-surface temperatures: Multidecadal trends and reliability of global reanalyses

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The poster presents the results of a reconstruction of Antarctic monthly mean near-surface temperatures spanning 1958-2012. One of the main motivations for adding this reconstruction to others previously published was to take advantage of the recently revised temperature record from Byrd to shed further light on long-term temperature changes in West Antarctica. The spatial interpolation relies on a kriging technique aided by spatio-temporal temperature covariances derived from three global reanalyses (ERA-Interim, MERRA, and CFSR). Our key findings for the entire 55-year period include statistically significant annual warming in the Antarctic Peninsula and virtually all of West Antarctica, but no significant temperature change in East Antarctica. In particular, we find that the warming is of comparable magnitude both in central West Antarctica and in most of the Peninsula, rather than concentrated either in one or the other region as previously suggested. The Transantarctic Mountains act, for the temperature trends, as a clear dividing line between East and West Antarctica, reflecting the topographic constraint on warm air advection from the Amundsen Sea basin. The reconstruction also serves to highlight artifacts in the 1979-2009 time series of the three reanalyses that reduces the reliability of their trends, illustrating a long-standing problem of this type of data sets in high southern latitudes.