

An Intercomparison of Temperature Trends in the U.S. Historical Climatology Network and Recent Atmospheric Reanalyses

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Temperature trends over 1979-2008 in the U.S. Historical Climatology Network (HCN) are compared with those in six recent atmospheric reanalyses. For the conterminous United States, the trend in the adjusted HCN ($0.327 \text{ }^{\circ}\text{C dec}^{-1}$) is generally comparable to the ensemble mean of the reanalyses ($0.342 \text{ }^{\circ}\text{C dec}^{-1}$). It is also well within the range of the reanalysis trend estimates (0.280 to $0.437 \text{ }^{\circ}\text{C dec}^{-1}$). The bias adjustments play a critical role, as the raw HCN data set displays substantially less warming than all of the reanalyses. HCN has slightly lower maximum and minimum temperature trends than those reanalyses with hourly temporal resolution, suggesting the HCN adjustments may not fully compensate for recent non-climatic artifacts at some stations. Spatially, both the adjusted HCN and all of the reanalyses indicate widespread warming across the nation during the study period. Overall, the adjusted HCN is generally consistent with the suite of reanalyses.

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