Advances in the HadCRUT5 record of global near-surface temperatures since 1850

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The new HadCRUT5 data set combines meteorological station air temperature records with sea-surface temperature measurements in a data set of near-surface temperature anomalies from the year 1850 to present. Major developments in HadCRUT5 include: updates to underpinning observation data holdings; use of an updated assessment of the impacts of changing marine measurement methods; and adoption of a statistical gridding method to extend estimates into sparsely observed regions of the globe, such as the Arctic. The data are presented as a 200-member ensemble that spans the assessed uncertainty associated with adjustments for long-term observational biases, observing platform measurement errors and the interaction of observational sampling with gridding methods. The impacts of methodological changes in HadCRUT5 on diagnostics of the global climate will be discussed and compared to results derived from other state-of-the-art global data sets.