



## HadCRUH2: a new global surface humidity monitoring product over land

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In a warmer climate it is expected that, at least where water availability is not limited, there will be more moisture in the atmosphere. This concept has held true on large spatial and temporal scales – as shown by previous surface humidity products e.g. HadCRUH and the Dai dataset. However, these do not extend beyond 2003, and since 2000, the ERA-Interim reanalysis shows a notable decline in relative humidity over land accompanied by a plateauing in the specific humidity. Variations in surface humidity have implications across the climate system, for example: radiative feedbacks; the energy budget; the hydrological cycle; and thermal loading on humans and animals. It is essential that these changes are monitored from year to year, ideally using multiple methodologically-independent products to explore the structural uncertainty.

HadCRUH2 is a much-needed update to HadCRUH. It spans from 1973 to 2011 and will be updated annually. It is based on NOAA National Climatic Data Center's near-global Integrated Surface Database (ISD), which contains sub-daily synoptic data, and uses a sophisticated quality control suite developed for the extremes dataset HadISD. Homogeneity assessment and adjustment has been performed using NCDC's pairwise homogenisation method. Uncertainties in homogenisation and sampling density are explored. HadCRUH2 provides a near-global, monthly mean-anomaly land-surface humidity product for a range of humidity variables with which recent trends and variability in humidity, temperature and their relationship can be assessed. It is freely available in gridded form.