



## **Comparisons of 3D data products of the global atmosphere for the past 120 years**

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In order to better understand, assess, and eventually predict climate variability and extremes, global 3-dimensional data sets of the atmosphere over a sufficiently long time period are needed. Until recently, there were mainly two reanalyses (NCEP/NCAR and ERA-40), which covered the second half of the 20th century. These are the most widely used data sets in atmospheric and climate science, but the period covered is still too short for many purposes.

In cooperation with the Atmospheric Circulation Reconstructions over the Earth initiative (R. Allan, UK Met Office, [www.met-acre.org/](http://www.met-acre.org/)), different data products have been developed recently that allow a 4-dimensional view of the global atmosphere further back than the mid 20th century. These data sets include the Twentieth Century Reanalysis Project (G. P. Compo, P. Sardeshmukh & J. Whitaker, CU/CIRES/CDC and NOAA/ESRL, [http://www.esrl.noaa.gov/psd/data/20thC\\_Rean/](http://www.esrl.noaa.gov/psd/data/20thC_Rean/)), monthly statistical reconstructions, and a new collection of historical upper-air data (CHUAN, see [www.historicalupperair.org](http://www.historicalupperair.org)). In this presentation we show comparisons of the different data products for several case studies as well as statistically using independent data.