Session: C40 Poster: Th119B

Recent changes in tropospheric water vapor over the Arctic

Mark Serreze[†]; Andrew Barrett; Julienne Stroeve
[†] CIRES, University of Colorado, USA
Leading author: serreze@nsidc.org

The Arctic is warming strongly, especially in autumn and winter. While this warming is strongly linked to loss of the sea ice cover, which allows for large heat transfers from the ocean to the atmosphere, many other factors also appear to be involved, including changes in atmospheric energy flux convergence, ocean circulation and cloud cover. It follows that this warming should be attended by increases in tropospheric water vapor. We examine recent changes in tropospheric water vapor over the Arctic for the period 1979 to 2010 using humidity and temperature profiles from 46 Arctic stations contained in the Integrated Global Rawinsonde Archive (IGRA), and humidity and temperature fields from six different atmospheric reanalyses (CFSR, MERRA, NCEP-1, JRA-25, ERA-40, ERA-Interim). All data sources point generally to increases in tropospheric water vapor, largest near the surface, which should be acting as a feedback to amplify warming. However, there are substantial differences between different data sources, linked to issues of data assimilation (in the reanalyses) and uncertainties in the rawinsonde data themselves.