Welcome!

Please join us for the next ATOC Colloquium on **Friday, October 13** from **11:00 AM–12:00 PM,** which will be held in **SEEC S228 and simulcast over Zoom**. This week's colloquium features **Dr. Isla Simpson (NCAR/CGD).** Please join us for conversation beginning at 10:45 AM and stay for lunch catered by Illegal Pete's afterwards.

Observed Humidity Trends in Dry Regions Contradict Climate Models

Earth System Models are our primary tool for projecting the future hydroclimate that society must adapt to so we must continually assess whether these models are accurately representing the processes of relevance to ensure such projections are reliable. Here we will compare historical trends in near surface water vapor since 1980 between observation-based datasets and Earth System Models from the CMIP6 archive. It will be shown that there is a major discrepancy in how atmospheric water vapor has changed over this time period with observation-based trends differing from the model distribution in a manner that cannot be explained by historical sea surface temperature trends or internal variability alone. This discrepancy displays close links with climatological aridity and is apparent in arid and semi-arid regions of the world throughout the year and only in the most arid months of the more humid regions. In these dry regions or seasons, the predominant signal in all model simulations is an increase in atmospheric water vapor, on average, over the last four decades that is close to the magnitude expected based on Clausius Clapeyron scaling. However, in observation-based data, this rise in atmospheric water vapor has not happened with trends in near surface humidity being near zero, on average. This suggests that the availability of moisture, whether that be from the land surface or transport, is lower in reality than in models in these dry regions, such that the rise in atmospheric water vapor does not keep up with the increasing atmospheric demand. This indicates a major gap in our understanding and modeling capabilities that could have severe implications for hydroclimate projections, as well as projections for fire hazard and heat extremes, moving forward.

Location: SEEC S228 & Zoom

Zoom:
https://cuboulder.zoom.us/j/98582201579

Password: ATOC

About the ATOC Colloquium

The Department of Atmospheric and Oceanic Sciences (ATOC) Colloquium is typically held **every other Friday** from **11:00 AM–Noon**. Colloquia alternate between the following formats: (A) Full-length talk by a faculty member or invited speaker, (B) Three conference-length talks by graduate students. If you would like to nominate a speaker (including self), please email the ATOC Colloquium Committee Chair, Prof. Andrew Winters (andrew.c.winters@colorado.edu). Please visit www.colorado.edu/atoc/colloquium for further details.