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Title: Water Vapor Sensing System II (WVSS-II) from Aircraft Meteorological Data Reports (AMDAR) Compared with Radiosondes Observations

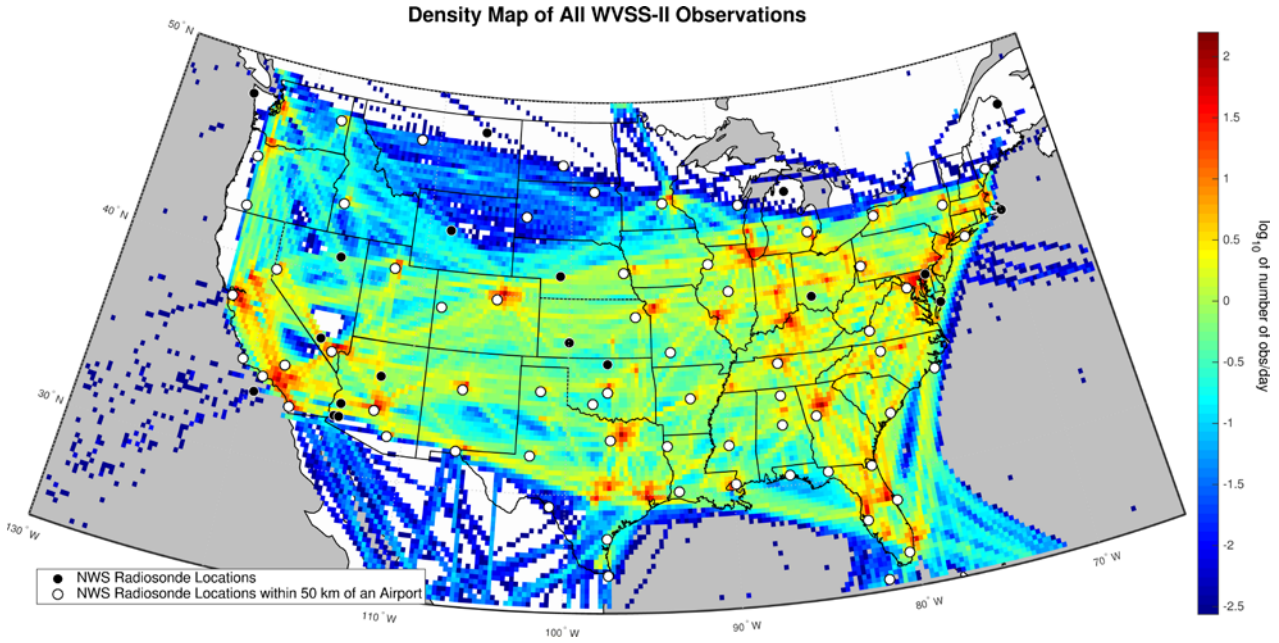
Type of Presentation: ___X__ Poster
_____ Oral

Short Abstract:
Upper air observations in the United States have traditionally been limited to radiosondes released by the National Weather Service (NWS). The radiosonde observations are released twice a day at 69 stations across the continental United States. This leads to spatially and temporally large gaps in upper air observations. One avenue to augment these observations and fill in these gaps is to use data collected by commercial aircraft during routine flights. Aircraft have routinely taken temperature, wind, and pressure observations and these data have been collected in real-time by the Aircraft Meteorological Data Reports (AMDAR) system.

Until recently, water vapor observations were not collected as these observations required a separate instrument and were not of immediate importance to flight crews as the other data are. With the development of the Water Vapor Sensing System II (WVSS-II) and its deployment aboard select aircraft, water vapor measurements have been added to this data set. This sensor is lightweight and designed to be low maintenance with high reliability. By having this additional water vapor data, complete thermodynamic and kinematic profiles of the atmosphere can be observed at a higher frequency than by radiosondes alone.

Validation studies indicated that WVSS-II shows good agreement with collocated radiosondes. However, validation of the WVSS-II has been limited to two short field validations in climatologically similar locations. In the present study, the WVSS-II is validated against operational NWS radiosonde launches creating a validation dataset that is much more spatially and seasonally diverse. By expanding the spatial comparison of the WVSS-II sensor, the sensor may be validated in multiple climate regimes and seasons allowing for the identification of potential locational and seasonal biases. Characterizing potential biases in the WVSS-II dataset will improve data assimilation processes of this data into numerical weather prediction models and create confidence for forecasting uses.

Water Vapor Sensing System II (WVSS-II) from Aircraft Meteorological Data Reports (AMDAR) Compared with Radiosonde Observations



All WVSS-II observations for 2015 with co-located radiosonde launch locations.

- Two short field experiments have taken place to validate the WVSS-II but both were located in similar climate regimes.
- This study is the basis that will allow for CONUS wide validation to occur to increase confidence of the WVSS-II in forecast operations and NWP assimilation.