GRUAN: Inter-agency research and education at Howard University Beltsville research site

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GRUAN (GCOS Reference Upper Air Network) is a network of stations that is thriving to characterize the thermodynamic state of atmosphere using a traceable reference for both remote sensing and insitu measurements. It is hoped and believed that the GRUAN measurements will serve as an anchor to the upper air sounding National Weather Stations. The initial GRUAN stations (15 in all) include the Howard University Beltsville Research Site. The site is highly instrumented and includes GPS, lidars, radiometers, many different upper air sounding instrumentation, a research grade air pollution monitoring site, and many other remote sensing equipment. The site has been involved in making measurements of temperature, water vapor, and ozone for several years. A number of satellite validation studies have also been completed or are being initiated. In addition, a close working relationship between the NWS station at Sterling, VA and the Beltsville site as well as NASA/GSFC have been on going. In this poster, we intend to summarize achievements in - satellite intercomparison of water vapor, temperature, and ozone - comparison of the NWS and other radiosonde measurements errors with lidars and other instrumentation - summary of summer ozone measurements at the site from several years - the sites approach to long term goals and how we will achieving GRUAN requirements - a scenario for characterization of satellite measurements using ground GRUAN networks - a comparison of actual data with reanalysis data base. Our aim is to show highlights of work that is ongoing and is applicable to improving the characterization of errors in climate data sets. GRUAN as a network and its promises as a strong climate network can only be realized if it can help characterize errors in the routine and abundant NWS measurements. We will highlight and discuss examples of such use in our poster.