Building a Quality Controlled Database of Meteorological Data from NASA Kennedy Space Center and the United States Air Force's Eastern Range

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The National Aeronautics and Space Administration's (NASA) Marshall Space Flight Center (MSFC) Natural Environments Branch (EV44) has provided atmospheric databases and analysis in support of space vehicle design and day-of-launch operations for NASA and commercial launch vehicle programs launching from the NASA Kennedy Space Center (KSC), co-located on the United States Air Force's Eastern Range (ER) at the Cape Canaveral Air Force Station. The ER complex is one of the most heavily instrumented sites in the United States with over 31 towers measuring various atmospheric parameters on a continuous basis. An inherent challenge with large sets of data consists of ensuring erroneous data is removed from databases, and thus excluded from launch vehicle design analyses. EV44 has put forth great effort in developing quality control (QC) procedures for individual meteorological instruments, however no standard QC procedures for all databases currently exists resulting in QC databases that have inconsistencies in variables, methodologies, and periods of record. The goal of this activity is to use the previous efforts by EV44 to develop a standardized set of QC procedures from which to build meteorological databases from KSC and the ER, while maintaining open communication with end users from the launch community to develop ways to improve, adapt and grow the QC database. Details of the QC procedures will be described. As the rate of launches increases with additional launch vehicle programs, it is becoming more important that weather databases are continually updated and checked for data quality before use in launch vehicle design and certification analyses.