A Detailed Examination of Relative Humidity at Summit Station, Greenland

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1 Abstract

After analyzing data from the National Oceanic Atmospheric Administration (NOAA) on Summit Station, Greenland, a heterogeneous correlation was identified between relative humidity and temperature, revealing three distinct linear relationships where only one was expected. This discrepancy was noted to be previously undocumented, and therefore prompted further investigation. First, relative humidity was plotted against time, highlighting two abrupt shifts in relative humidity values: after segmenting the data into three regions based on the noticed sudden changes, the regions aligned perfectly with the three linear patterns seen earlier. A notable drop in relative humidity occurred around March 13, 2015, and a missing day of data in July 2017 preceded consistently higher values—an unlikely occurrence for relative humidity. Upon further examination, evidence of sensor miscalibration emerged, leading to the application of the Clausius-Clapeyron model to assess the accuracy of each data segment. Given the potential impact of inaccurate relative humidity data on Greenland-related research, a scientific report was submitted to NOAA, detailing the evidence and suggesting potential solutions. Ongoing collaboration with scientists at NOAA aims to confirm these findings and propose corrective measures for future studies.