



An observational study of the causes and effects of snow accumulation in the Antarctic

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Beginning in 2003, over ten acoustic depth gauges (ADGs) have been placed in several remote areas of Antarctica, including the Ross Ice Shelf, West Antarctica, and on several icebergs, with the primary purpose being to measure snow accumulation at each location. The acoustic depth gauges have been installed on automatic weather stations (AWS) as part of the NSF sponsored Antarctic Automatic Weather Stations project (AAWS), which currently has over 65 stations located across the continent. The AWS take measurements of temperature, pressure, wind speed and direction, and relative humidity with the data available in near real time via the Argos System on board the NOAA polar-orbiting satellites. While data from the ADGs cannot uniquely determine the causes of accumulation, these measurements, coupled with measurements from the AWS, as well as satellite data and model output, can give a clearer understanding of the causes of snow depth change at each location. In particular, the AWS data allows a partitioning of the ADG data into five types: accumulation caused by blowing snow, precipitation, or a combination of the two, as well as two unknown categories - undetermined and unexpected. This talk will discuss the methodology used in determining this classification system, discuss accumulation trends across the Antarctic, and introduce a new blowing snow threshold for the Antarctic.