



## **An Overview of the Antarctic Automatic Weather Stations Project**

C. Stearns, G. Weidner, L. Keller, J. Thom, M. Lazzara, and S. Knuth  
University of Wisconsin-Madison

Beginning in 1980, the University of Wisconsin has built, installed, and maintained a network of automatic weather station (AWS) units in the Antarctic as a part of the United States Antarctic Program, funded by the National Science Foundation's Office of Polar Programs. The development of low-power computer components beginning in the 1970s, and the placement of the Argos DCS on the NOAA series of polar-orbiting satellites, have made possible the deployment of remote low-power AWS units capable of operating in the extreme climate of Antarctica. The reliability of these components has allowed for long periods of AWS operation at many sites. Over the last 28 years, several updated versions of the stations have been built and installed, each with improved capabilities. Most units measure temperature, atmospheric pressure, wind speed and direction, and relative humidity. Some units include other sensors, such as temperature at the top and bottom of the tower, temperature profiles into the snow up to ten meters, and sensors to measure snow accumulation. The observations and data collected from the network have been applied to a variety of meteorological problems including, but not limited to, katabatic and barrier wind studies, mesoscale circulation and sensible/latent heat flux studies, operational weather forecasting, station climatology, micrometeorology research, long term ecological research studies, and fog studies. Today, the network has reached its largest extent with over 65 stations installed and operating. New applications of the stations continue to be explored, such as the monitoring of meteorological parameters along with the position of icebergs, and as validation points for precipitation/accumulation studies. A description of the instrumentation, extent of the network, and impacts of the AWS project, as well as a description of a new AWS that makes use of the Iridium

system, will be presented.