

THE MADISON POLAR CLIMATE AND WEATHER STATION: A STATUS REPORT TO THE COMMUNITY

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<https://madsoncollege.edu/antarctic-meteorology-project>

1. STATUS

Madison Area Technical College (Madison College) in conjunction with the University of Wisconsin-Madison (UW-Madison) has worked on the development of a polar climate and weather station over the past year (Lazzara et al., 2017). Leveraging expertise with the existing Automatic Weather Station (AWS) program at UW-Madison (Lazzara et al., 2012), this new project combines expertise from both institutions in electronics and Antarctic meteorology. To date, over 8 undergraduate students have worked on the project in addition to seasoned staff members.



Figure 1. Andy Kurth is seen here working on the first Madison Polar Climate and Weather Station (PCWS) at Willie Field AWS test site.

This past year has seen the development of the first prototype electronics core, which is the focus of the project. A test board has been installed at Willie Field AWS test facility, to see how well it performs over the winter (Figures 1 and 2). Efforts are underway for a more complete prototype electronics core. In addition to a new board, verification testing of various sensors is in progress.



Figure 2. Standing next to the first prototype system, Matthew Lazzara overlooks the first test installation of a PCWS at Willie Field AWS test site. Observation Hill, near Scott Base, and McMurdo Station, Antarctica are seen in the background.

This presentation will provide an overview of the polar climate and weather station (PCWS) project status. Plans for the future test installations, including side-by-side testing, will be outlined. Lessons learned (to date) will be

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reviewed. An update on the student involvement – a central aspect of this project – will be provided.

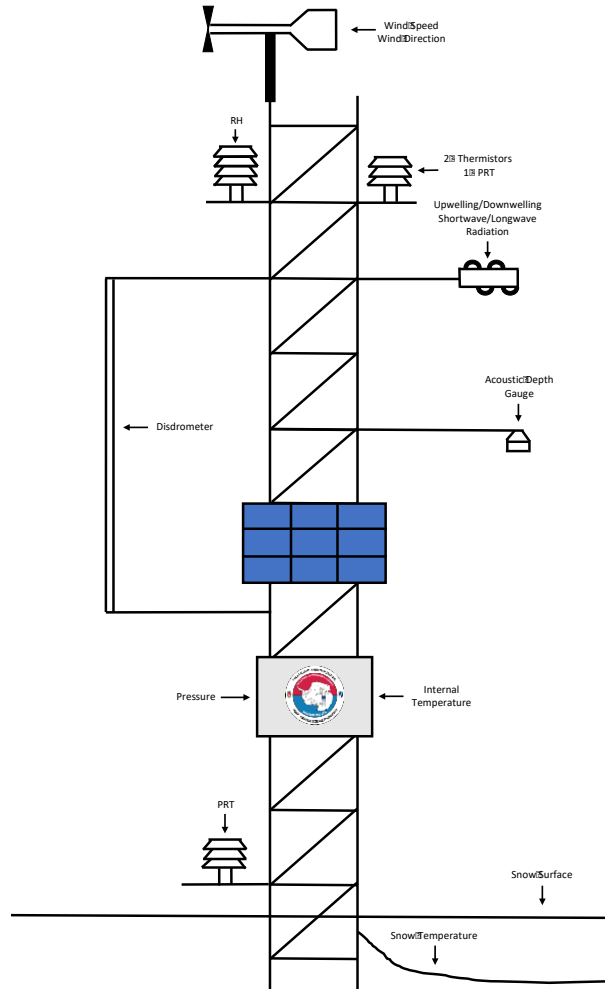


Figure 3. A working mock-up diagram of the Polar Climate and Weather Station (PCWS) illustrates a possible configuration of the new system. Not all sensors on this will necessarily be included on the final version (e.g. disdrometer). (Courtesy of C. Costanza)

2. ACKNOWLEDGEMENTS

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3. REFERENCES

Lazzara, M.A., G.A. Weidner, L.M. Keller, J.E. Thom, J.J. Cassano, 2012: Antarctic automatic weather station program: 30 years of polar observations. *Bull. Amer. Meteor. Soc.*, **93**, 1519-1537, doi:10.1175/BAMS-D-11-00015.1.

Lazzara, M.A., A.J. Kurth, A.A. Limberg-Dzekute, T.P. Norton, F.A. Filip, C.C. Folk, J.B. Shoemaker, A. Rodrigues, R. Decklever, J. Miller, T. L'Ecuyer, L.J. Welhouse, D.E. Mikoljczyk, C.A. Costanza, G.A. Weidner, and L.M. Keller, 2017: The Madison Antarctic Automatic Weather Station: The next generation polar climate and weather station. 12th Workshop on Antarctic Meteorology and Climate, Boulder, CO, June 26-26.

