

METEOROLOGY

Mike Carmody, Principal Investigator, United States Antarctic Program

Palmer Station is Station 89061 in the World Meteorological Organization (WMO) Worldwide Network. Automated surface synoptic observations are made 8 times each day and emailed to the National Atmospheric and Oceanographic Administration (NOAA) for entry into the Global Telecommunication System (GTS).

The Palmer Automatic Weather Station (PAWS) is a collection of sensors, computers, and software that records the meteorological data and generates synoptic reports. PAWS began recording data in September of 2015. It was a replacement for the Palmer Meteorological Observing System (PalMOS) that was taken down in November 2017. The PAWS sensors and data acquisition hardware are located on a ridge in the backyard at -64.774130° -64.047440° at an elevation of 38.3 meters above sea level using the World Geodetic System-84. In addition to the synoptic and METAR reporting, PAWS also archives the current conditions at one-minute intervals and displays both raw data and graphs of the sensor data on our local intranet.

The Research Associate acts as Chief Weather Observer on station, measuring, compiling and distributing all meteorological data. Snow accumulation is physically observed by taking an average of five accumulation stakes found near the PAWS system. All weather data is archived locally and forwarded once per month to the University of Wisconsin on the first day of each month for archiving and further distribution.

The Palmer Snow Accumulation measurement field was moved away from the influence of the local station area into a gulley in the backyard in 2016. The field of stakes is a series of meter sticks sleeved over five rebar anchors spanning a south facing side, a north facing side, and bottom of the gulley. These data come from the average daily accumulation as measured at each of the five snow stakes. As seen in Figure 18, this snow year was slow to accumulate, most likely due to warm temperatures and at times, rain. October was much closer to average temperature and cooler on average than the last couple months. Palmer started October with an average snow pack, and a total of 57 cm (22 inches) of snow fell during the month. Over half of that accumulation did not melt or blow away. This amount of precipitation for October was not unprecedented, but has not occurred in six years.

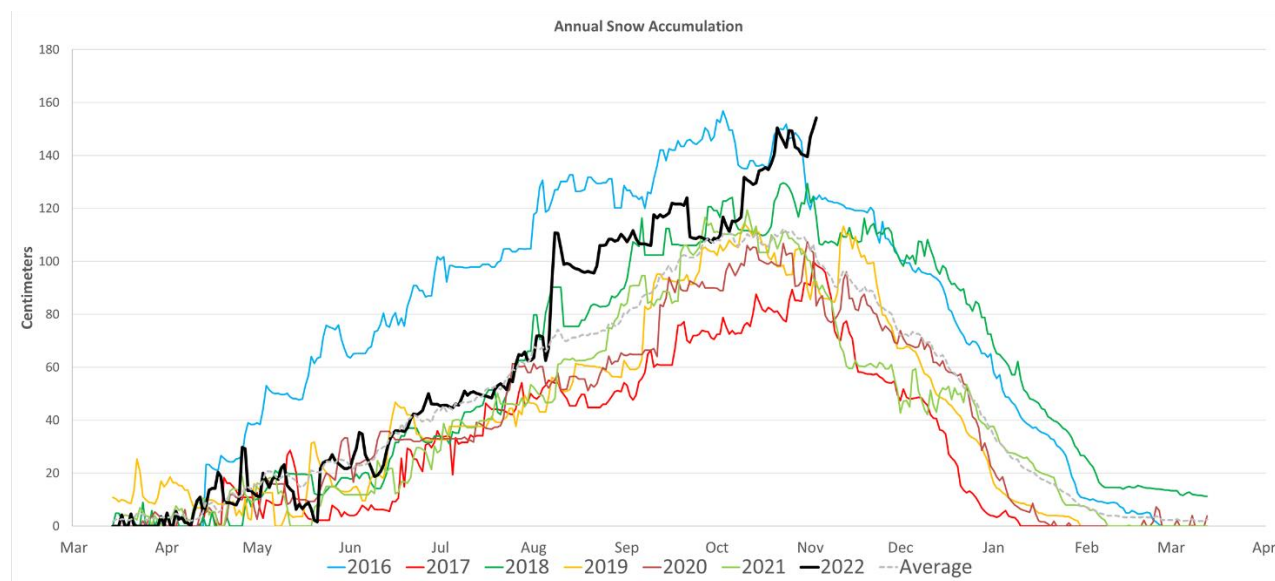


Figure 18- Snow accumulation dating back to 2016. The black line represents the current 2022 season.

The local weather station (PAWS) operated well throughout the month. All three remote AWS sites require maintenance so their functionality this season were sporadic at best. The main temperature sensor failed on October 17 and was replaced on October 18. Erroneous data was removed from archive. A loose cable resulted in an outage in the early hours of October 30. One minute weather data is archived on the AMRC website:

<http://amrc.ssec.wisc.edu/data/ftp/pub/palmer/>.

Palmer Monthly Met summary for October, 2022

Temperature
Average: -1.6°C / 29.1°F
Maximum: 4.3°C / 39.74°F on 5 Oct 08:25
Minimum: -5.8°C / 21.56°F on 16 Oct 11:07
Air Pressure
Average: 973.6 mb
Maximum: 1001.4 mb on 3 Oct 12:07
Minimum: 929.3 mb on 9 Oct 11:33
Wind
Average: 15.3 knots / 17.6 mph
Peak (5 Sec Gust): 59 knots / 68 mph on 18 Oct 19:51 from NNE (026 deg)
Prevailing Direction for Month: NNW
Surface
Total Rainfall: 55.1 mm / 2.17 in
Total Snowfall: 57 cm / 22.2 in
Greatest Depth at Snow Stake: 150.4 cm / 58.7 in
WMO Sea Ice Observation: 1-5 bergs, bergy bits, growlers, and brash ice
Average Sea Surface Temperature: -1.05°C / 30.1°F