Weather Observation Timeline

Palmer Station, Antarctica

This document presents a high-level timeline of the weather observation program at Palmer Station from 1989 – present. Information was sourced from old logs, SOPs, and emails. For any questions or corrections, contact the Palmer Research Associate (pal.ra@usap.gov).

Last updated 9 October 2023 by Ben Rosen-Filardo

1989 Apr 01
Start of 4x daily manual weather observations (00UT, 06UT, 12UT, 18UT)

1990 Mar 17
Start of snow stake measurements on Gamage Point. This was a single stake located between the Aquarium and Pump House. Due to the location near the decking, snow may have been shoveled onto the snow stake. A hand rail on the deck was used to determine New Snow for the day at the same time.

1991 Nov 01
Start of WMO sea ice observations. These are WMO physical observations made by the RA and could be subjective. For more information, see the README located in /seasurfobs_snowacc.

1996 Nov 14
New maximum indicating thermometer installed. Sometime in 1994 – 1996, the maximum indicating thermometer broke, and maximum temperatures begun being taken from a Davis weather station instead. With the installation of this new thermometer, the Davis stopped being used.

1997 Mar 27
New barometer installed (Belfort 8256), replacing the Wallace & Tiernan aneroid.

2000 Nov 01
0600 UT manual observation abolished due to limited personnel availability. To contribute to the daily averages:

- 0600 UT barometric pressure now read from barograph
- 0600 UT temperature now read from ENPAWS (an old experimental automated weather station that I haven't found much info about)

2001 Nov 01
PALMOS AWS, located on Gamage Point, begins reporting

2002 Feb 23
0600 UT temperature now read from PALMOS rather than ENPAWS

2003 May 20
Pressure now read from PALMOS rather than the aneroid barometer. Pressure values from the PALMOS barometer are on average 2.5 mb higher due to the different location, different altitude, and different calibration.

2003 Sep 01
Temperature now read from PALMOS rather than manual thermometers. (Note: Some logs say this happened on October 1, not September 1.)

2003 Oct
Wind now read from PALMOS rather than old Bendix wind monitor. From the weather station log:

> *Beginning this month (October 2003), winds are being reported from the PALMOS wind monitor. PALMOS gives higher resolution data than the previous wind monitor, records digitally and is more recently calibrated. The format of this report has been slightly altered to reflect the new instrument. Instead of one 'maximum wind speed' field for each day, there are two. The first wind speed field (Peak 5-Sec Wind) is the maximum 5-second sustained gust in a given day. The second Wind Field (Peak 2-min Wind) is obtained by taking the wind measurements for the day, breaking them into two minute pieces, averaging all of the readings in a given piece to get a series of 2-minute averages, and then taking the maximum of these 2-minute average values. The Wind Direction field is associated with the Peak 2-minute average reading for a given day. Average wind speed is given by averaging each of the 2-minute average readings for a day. Prevailing wind direction is given by removing all of the readings with zero wind speed, then sorting the remaining finite wind speed measurements into eight bins (N, NE, E, SE, S, SW, W and NW), according to which direction they are closest to. Whichever direction has the most readings associated with it is the Prevailing Wind direction for that day.*

2003 Nov 22
PALMOS display now used for visibility distances, rather than manual observation

2003 Dec 18
After a two year overlap between manual weather observations and PALMOS, the manual observations are discontinued. The only manual data collection remaining is snow stake depth, sea ice coverage, land snow coverage, and sea water temperature, all of which are recorded daily at 1800 UT.

2004 Oct 06
Sampling interval changed from one to two minutes

2015 Sep 11
PAWS, located in the backyard, begins reporting. Data interval is 1 minute instead of 2 minutes with PALMOS. PAWS and PALMOS run concurrently until 2017 (see below).

2015 Oct 31
AWS1 (Wauwermans Islands) begins reporting

2016 Feb 25
AWS2 (Joubin Islands) begins reporting

2016 Apr 13
Start of snow stake measurements in the backyard (5 stakes). The average depth of the five stakes is now used for the snow stake “Accumulation" and the difference between the day before and the day of average is recorded as the New Snow.

2016 Aug 01
AWS3 (Gamage Point) begins reporting. This AWS is a test platform installed on the old PALMOS Gamage Point tower. The instrumentation was later removed and reused for the new AWS3 in the Gossler Islands (see below).

2016 Oct 12
Optical sensors (pyranometer and quantum PAR) installed on PAWS tower. Due to issues with sensor configuration, the pyranometer data clips at 1,085 W/m^2 and the quantum data clips at 1,515 $\mu mol/s/m^2$.

2017 Oct 31
PALMOS ceases reporting. End of snow stake measurements on Gamage Point (single stake).

2018 Jan
AWS3 removed from Gamage Point to be reinstalled in the Gossler Islands

2019 Jan 08
AWS3 (Gossler Islands) begins reporting

2019 Nov 20
Wind speeds and gusts had to be corrected between 2/28/2019 17:56 UTC - 11/20/2019 16:17 UTC due to the wrong propeller being installed on the BASE wind sensor. All files with "_fix" appended to them have been corrected. The correction coefficient that was applied was 0.588.

2022 Jan 11
Quantum PAR data clipping resolved. Pyranometer clipping persists.

Weather Station Instrumentation

BASE (Backyard, -64.774130°, -64.047440°)

Instrument	Make/Model	Output
Windbird	RM Young 05108-45	Wind speed, m/s
		Wind direction, degrees (true)
Temp/RH	Rotronic HC2S3 in aspirated enclosure	Air temperature, °C
		Relative humidity, %
		Dew point, °C
Pyranometer	LI-COR LI-200	Solar irradiance, W/m^2
Quantum PAR	LI-COR LI-190	Photosynthetically active radiation, $\mu mol/s/m^2$
Barometer	Honeywell HPA200	Atmospheric pressure, mbar
Tipping bucket rain gauge	Mesotech MT-PA01D 8"	Melted precipitation, mm
Present weather/visibility sensor	Optical Scientific, Inc. OWI-430 WIVIS	Present weather, reported per Table 12-2 of Federal Meteorological Handbook No. 1
		Visibility, m. Maximum range is 10 km.
Ceilometer	Eliasson CBME80A	Cloud base (lower level, middle level, upper level), ft
		Vertical visibility, ft

AWS1, AWS2, AWS3

Instrument	Make/Model	Output
Windbird	RM Young 05108-45	Wind speed, m/s
		Wind direction, degrees (true)
Temp/RH	Rotronic HC2S3 in non-aspirated enclosure	Air temperature, °C
		Relative humidity, %
		Dew point, °C
Barometer	Honeywell HPA200	Atmospheric pressure, mbar

AWS1: Wauwermans Islands, -64.918389°, -64.048514°

AWS2: Joubin Islands (Howard Island), -64.786987°, -64.360658°

AWS3: Gossler Islands, -64.712916°, -64.348396°