PHYSICAL OCEANOGRAPHY

Palmer Station has a tide and conductivity gauge located on the west side of the pier at -64.774558° -64.055580° at a depth of 11.46 meters (WGS-84). It was reinstalled at this deeper depth after the completion of the Palmer Pier in June 2022.

The Research Associate acts as the station's physical oceanography observer by maintaining and observing the sea state. Observations of sea ice extent and growth stage is recorded along with continuous tidal height, ocean temperature, and ocean conductivity.

The tide gauge remains offline while we wait for the new cable to be manufactured and shipped to Palmer Station, and for the ice-damaged tide tube and sleeve to be repaired and replaced. ASC Divers will be on site in January 2026 and will assess the condition of the tide gauge while they are here. Be on the lookout for any updates moving forward.

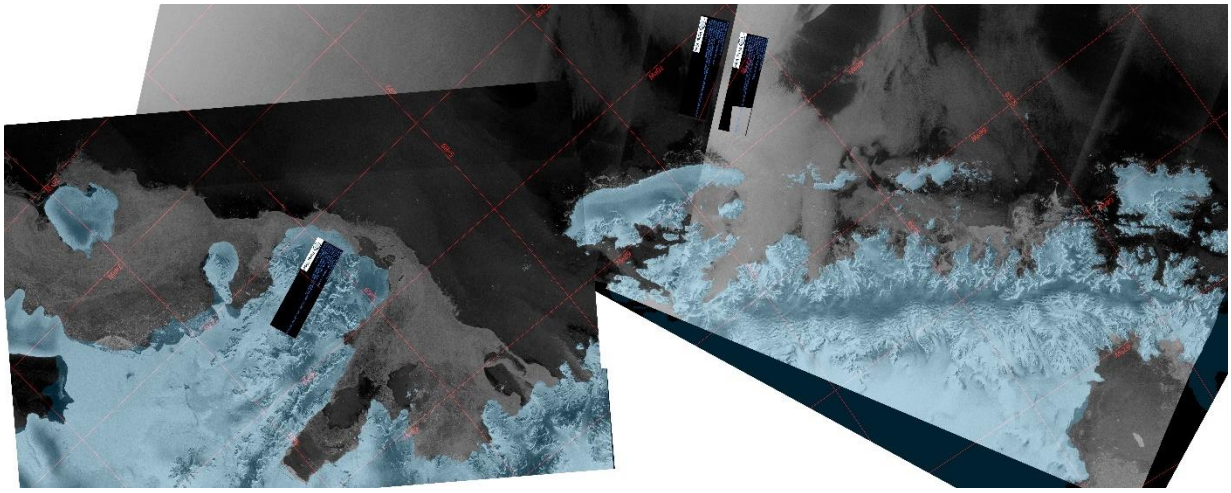

Figure 10. November 25-26th satellite imagery composite of sea ice along the Western Antarctic Peninsula. Source: Polar View/Sentinel-1A

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 at five accumulation stakes found near the PAWS system. All weather data is archived locally and forwarded to the University of Wisconsin on the first day of each month for archiving and further distribution. The PAWS ceilometer has not been reporting since August 10th. Troubleshooting is ongoing.

November was a busy month for the meteorological system, with two visits each to the Joubin and Gossler Islands remote weather stations to get them back online. All sensors on the Joubins station (AWS2) are now reporting, except for the barometer. The Gosslers station (AWS3) is reporting intermittently, likely due to a loose antenna mount. Work is ongoing to address these issues. The Wauwerman Islands station (AWS1) is working reliably but will require a battery replacement in the coming months.

Palmer Research Associate troubleshooting the weather station on Joubin Island #1, November 19th 2025. *Image credit: Andrew Terry*

Weather Information for November 2025:

Similar to October 2025, November was unusually calm and dry. This was due to the absence of strong storms in the Drake Passage and northern Bellingshausen Sea. These storms, which are usually intense and frequent at this time of year, bring strong NNE winds, warm air, and heavy rain. This month, Palmer Station saw:

- **Record-low precipitation:** 12.2 mm, less than any prior November (1990-present)
- **Record-low high temperature:** 3.3 °C, lower than the high temp for any prior November (1989-present), and much lower than the mean of 6.1 °C.
- **Record-low average November wind speeds:** 7 knots, lower than the November average of 12 knots (2010-present)
    - Tied for lowest with 2017 and 2019
- **Record-low wind events:** 5 days of 30+ knot winds, fewer than any prior November (2010-present)

One-minute weather data is archived on the AMRDC website: https://amrdcdata.ssec.wisc.edu/dataset?q=Palmer+Station.

Palmer Monthly Meteorological Summary for November 2025

Temperature
Average: -0.7 °C / 30.8 °F
Maximum: 3.3 °C / 37.9 °F on 23 Nov 07:27
Minimum: -4.0 °C / 24.8 °F on 18 Nov 04:47
Air Pressure
Average: 986.8 mb
Maximum: 1004.9 mb on 21 Nov 15:16
Minimum: 965.4 mb on 1 Nov 17:53
Wind
Average: 7 knots / 8.1 mph
Peak (5 Sec Gust): 50 knots / 58 mph on 10 Nov 02:57 from NNE (16 deg)
Prevailing Direction for Month: ESE
Surface
Total Melted Precipitation: 12.2 mm / 0.48 in
Total Snowfall: 21 cm / 8.2 in
Greatest Depth at Snow Stake: 88.6 cm / 34.6 in
WMO Sea Ice Observation: 11-20 bergs, bergy bits, growlers, brash ice
Average Sea Surface Temperature: Not available due to broken tide sensor

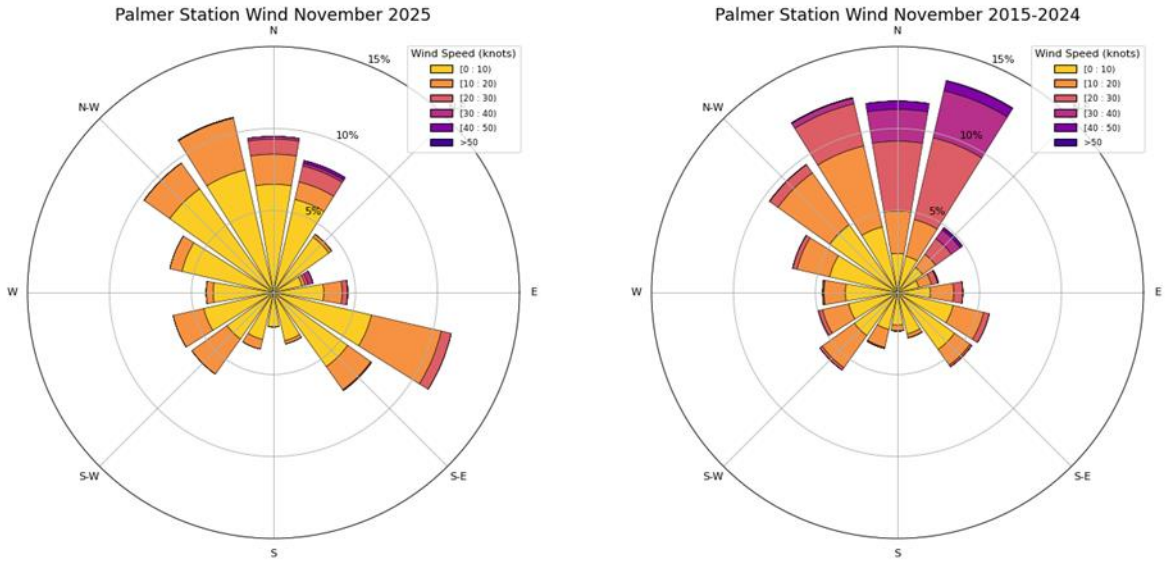

Figure 11. Palmer Station wind roses for November 2025 (left) and November 2015-2024 (right). The strong NNE winds that typically characterize this time of year were largely absent in 2025.

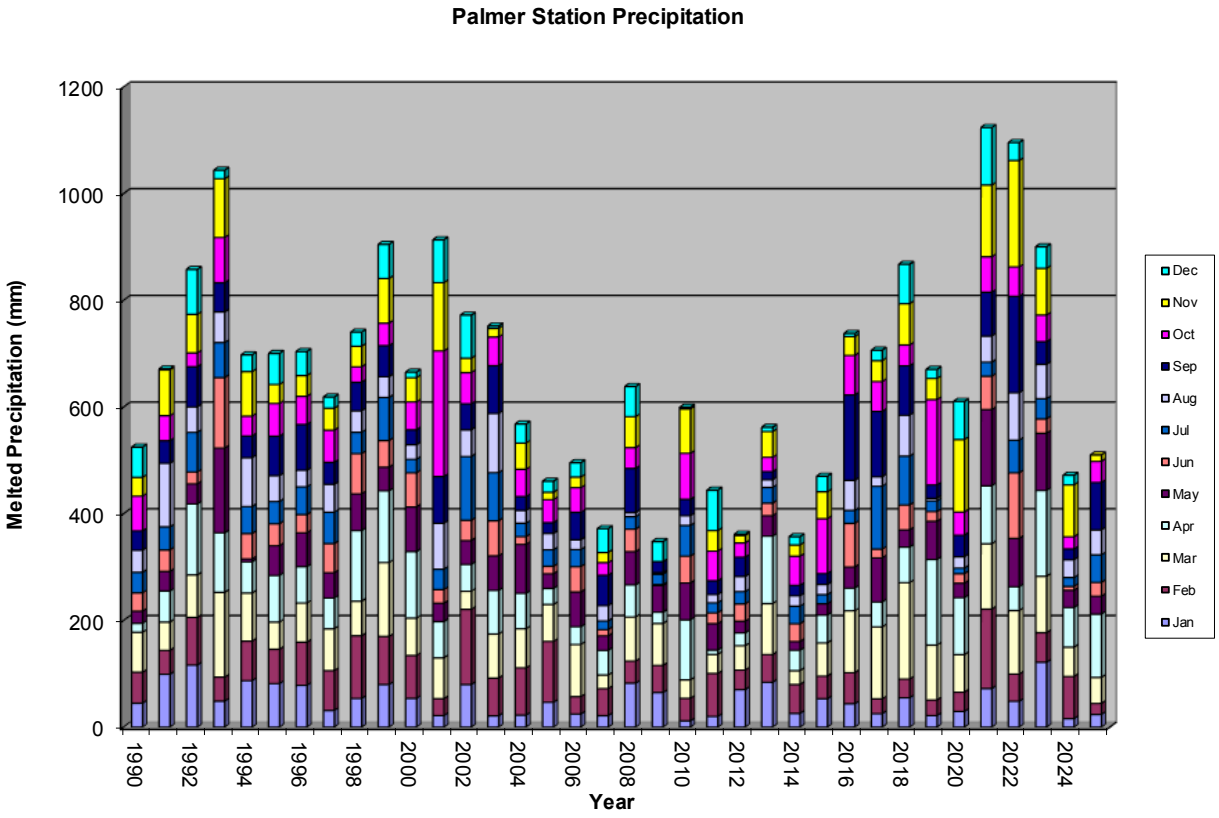

Figure 12. Palmer Station precipitation, 1990-present. November 2025 saw less precipitation than any prior November, with just 12.2 mm of melted precipitation.

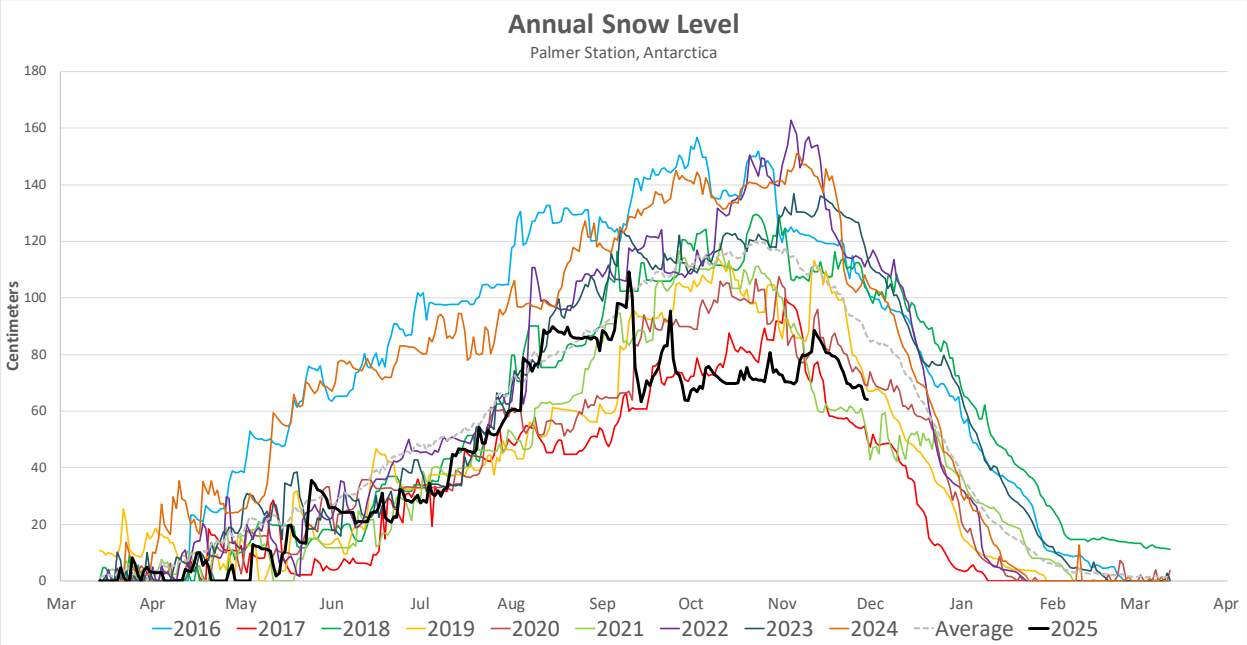

Figure 13. Palmer Station snow level (average of five backyard snow stakes), 2016-present.