

Antarctic automatic weather stations, austral summer 1985–1986

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The automatic weather stations (AWS) in Antarctica measure air temperature, wind speed and wind direction at a nominal height of 3 meters above the surface, and air pressure at the electronics enclosure. Some AWS units measure relative humidity and/or the air temperature difference between three meters and 0.5 meter above the surface (Stearns 1984). The AWS unit is controlled by a microcomputer which updates the data at a nominal 10-minute interval and transmits three to five data points for each sensor at a nominal 200-second interval to ARGOS-equipped, polar-orbiting satellites.

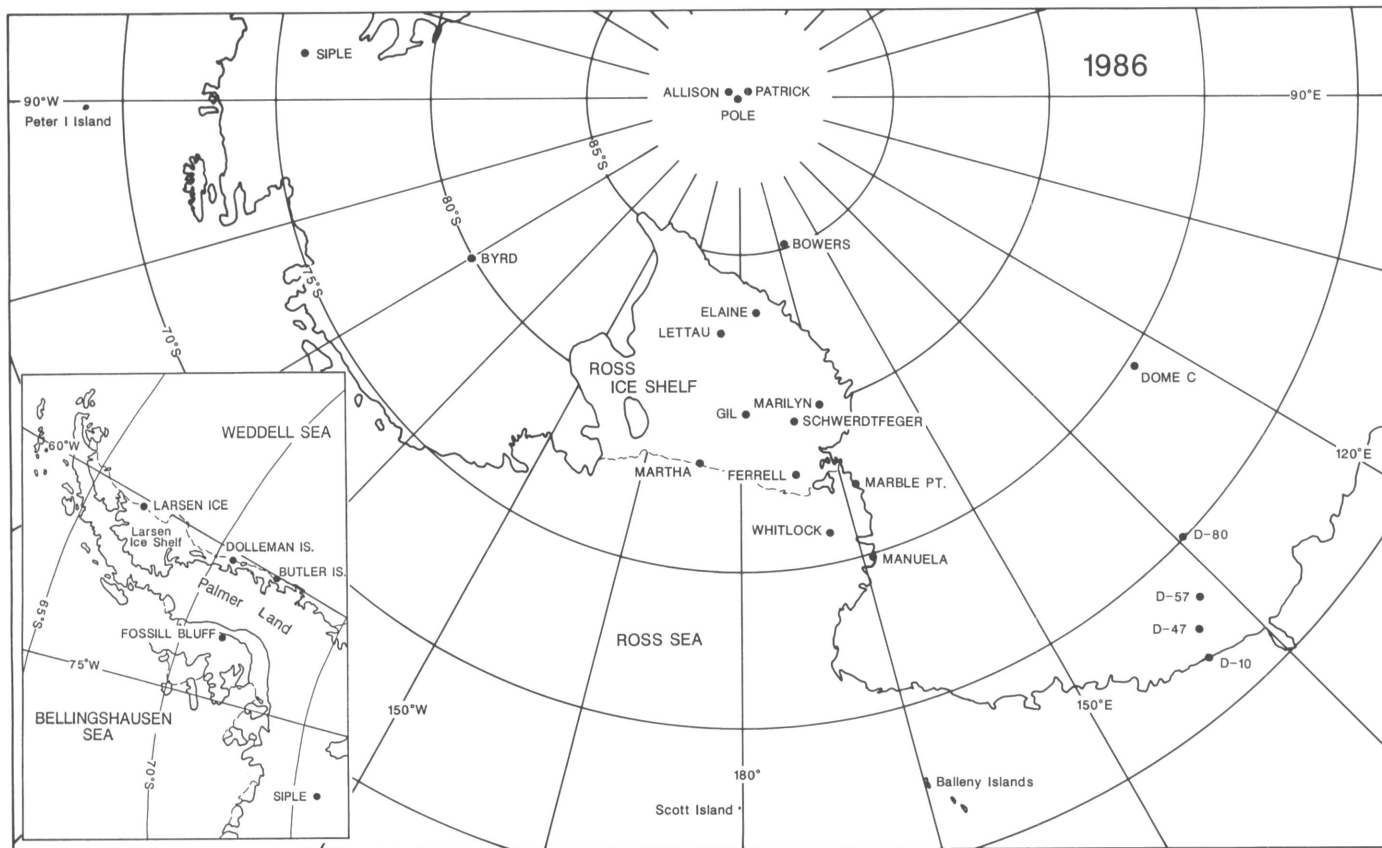
- The AWS units in Antarctica support the following studies:
1. Barrier wind flow along the Antarctic Peninsula and the Transantarctic Mountains;
 2. Katabatic flow down the Adelie Coast, Byrd Glacier, Beardmore Glacier, and Reeves Glacier;
 3. Mesoscale circulation on the Ross Ice Shelf;
 4. Climatology of Byrd Station and Dome C;
 5. Sensible and latent heat fluxes on the Ross Ice Shelf;
 6. Oceanographic support;
 7. Meteorological support for air operations using a local user terminal at McMurdo Station; and
 8. Influence of Amundsen-Scott Station on the local climate.

The table gives the site name, AWS ID, location, and start date for AWS units in operation for 1986. As of 15 May 1986, 20 AWS units were operating satisfactorily, two units were received intermittently, one has stopped being received, and two have questionable wind speed and direction units (aerovane). The AWS unit at Siple Station (8910) is not in operation yet. The figure is a map showing the locations of AWS units in Antarctica including the east side of the Antarctic Peninsula. The AWS locations during the 1985 are given in Stearns and Weidner (1985).

AWS locations for 1986

Location or name	AWS ID	Latitude (in degrees)	Longitude (in degrees)	Elevation (in meters)	Start date
Purpose: Katabatic wind flow; G. Wendler, University of Alaska					
D-10	8901	66.70 S	139.80 E	240	15 Jan 84
D-47	8914	67.38 S	138.72 E	1650	13 Nov 85
D-57	8916	68.18 S	137.52 E	2103	17 Nov 85
D-80	8919	70.02 S	134.72 E	2500	11 Dec 85
Dome C	8904	74.50 S	123.00 E	3280	13 Jan 83
Purpose: Climatic record; C. Stearns, University of Wisconsin					
Byrd Station	8903	80.00 S	120.00 W	1530	05 Feb 80
Siple Station	8910	75.90 S	84.00 W	1054	—
Purpose: Naval Support Force Antarctica Support network					
Marble Point	8906	77.43 S	163.75 E	121	05 Feb 80
Ferrell	8907	78.02 S	170.80 E	44	10 Dec 80
Whitlock	8913	76.10 S	168.30 E	274	23 Jan 82
Purpose: Ross Ice Shelf network; C. Stearns, University of Wisconsin					
Marilyn	8921	79.98 S	165.03 E	75	16 Jan 84
Schwerdt	8924	79.57 S	169.45 E	50?	24 Jan 85
Gil	8925	80.00 S	179.00 E	50?	24 Jan 85
Bowers ^a	8909	85.20 S	163.40 E	2014?	11 Jan 86
Elaine ^a	8911	83.15 S	174.46 E	100?	28 Jan 86
Lettau ^a	8908	82.59 S	174.27 W	30?	29 Jan 86
Purpose: Oceanographic support; S. Jacobs, Lamont-Doherty Geological Observatory					
Manuela	8922	74.92 S	163.60 E	80	06 Feb 84
Martha	8923	78.31 S	172.50 W	42	01 Feb 84
Purpose: Barrier Wind, Antarctic Peninsula; C. Stearns, University of Wisconsin					
Larsen Ice ^a	8926	66.97 S	60.55 W	17	01 Jan 86
Dolleman Island ^a	8917	70.70 S	60.97 W	395	18 Feb 86
Butler Island ^a	8902	72.20 S	60.34 W	90?	01 Mar 86
Fossil Bluff ^a	8920	71.33 S	68.28 W	765	06 Mar 86
Purpose: South Pole Station influence; A. Hogan, State University of New York					
Pole ^a	8918	90.00 S			29 Jan 86
Patrick ^a	8905	89.88 S	45.00 E		28 Jan 86
Allison ^a	8900	89.88 S	45.00 W		28 Jan 86

^a New sites started in austral summer 1985-1986



Map of Antarctica with automatic weather station locations and site names for 1986. The automatic weather station ID, latitude, longitude, and start date are given in the table.

The austral summer 1985–1986 involved a major relocation of AWS units from the Ross Island vicinity. The AWS units formerly at Laurie, Tiffany, Katie, Manning, and Meeley sites were retrieved, repaired, or replaced as needed and modified for short booms, ground-plane antennas, vertical air temperature difference, relative humidity and waterproof enclosures. Three units were deployed to the South Pole in support of the study on the possible influence of the Amundsen-Scott Station on the local climate. Two units were installed on the Ross Ice Shelf near the Beardmore Glacier, and an AWS unit was installed at the top of the Beardmore Glacier (items 1, 2, 3, 5, and 7 above). The field work details are given by Weidner (1986).

Attempts to find Marilyn site (8921) were unsuccessful. The unit is received occasionally. Martha site (8923) and Manuela site (8922) transmit data but need repairs to the wind sensor (aerovane). Neither site was reached during austral summer 1985–1986.

The British Antarctic Survey installed four AWS units, three on the east side of the Antarctic Peninsula and one on the west side near Fossil Bluff. The AWS units in support of the katabatic wind study of G. Wendler, University of Alaska were serviced by R. Flint with equipment support by the University of Wisconsin.

The local user terminal at McMurdo Station was updated for the B data format (Stearns and Weidner 1983). Accommodation was made for the humidity and air-temperature difference data, and for the new locations and site names.

Michael Savage and Hugh Sloten were based at McMurdo Station, Antarctica from 5 January 1986 to 1 February 1986. George Weidner was based at McMurdo Station from 5 January

1986 to 5 February 1986. Edward Eloranta was based at McMurdo Station from 5 January to 7 February 1986.

Mark Lewis of the British Antarctic Survey installed the AWS units along the Antarctic Peninsula. Robert Flint repaired the four AWS units between Dumont d'Urville and Dome C with field support from Expedition Polaris Francaises. Lt. Arlie Buchanan provided valuable field assistance in the McMurdo Station area. The support of ITT Antarctic Services, the National Science Foundation staff, the pilots and crew of VXE-6 squadron and the personnel of the Naval Support Force Antarctica are much appreciated. Without them the research activities would not have been possible. The use of two fish shacks from the Eklund Biological Center provided clean and quiet work space and is appreciated.

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