

AWS Field Report 2016-17

Field Team: Lee Welhouse, Carol Costanza, and Dave Mikolajczyk

1. Nov. 4 – **Schwerdtfeger (8913)** could not find the AWS
2. Nov. 5 – **Marble Point (8906) and Marble Point II (99503)** stations inspected
4. Nov. 7 – **Pegasus North (99508)** removed the enclosure and boom back to the lab
5. Nov. 8 – **Cape Bird (99504)** replaced aerovane
5. Nov. 9 – **White Island (99505)** station inspected
6. Nov. 9 – **Minna Bluff (99501)** replaced the high wind speed sensor
7. Nov. 15 – **Laurie II (21360)** installed a new power system
8. Nov. 16 – **Emma (8919)** installed a new power system
9. Nov. 19 – **Schwerdtfeger (8913)** raise with a tower 7 ft. and raise power system to surface
10. Nov. 23 – **Willie Field (99502)** dug down about 4 feet and hit too much ice to recover batteries
11. Nov. 23 – **Lorne (99507)** replaced pressure sensor and solar panel
12. Nov. 25 – **Pegasus North (99508)** re-installed the enclosure and boom, still not transmitting
13. Nov. 28 – **Windless Bight (99506)** installed new 3-battery PS and raised instrumentation
14. Nov. 30 – **D-85 (8912)** installed new power system by Philippe Dordhain
15. Dec. 1 – **Willie Field (99502)** installed new 3-battery power system and solar panel
16. Dec. 1 – **Pegasus North (99508)** changed the Ethernet cable to the red Comm 2 port
17. Dec. 3 – **Alexander Tall Tower! (99602)** raised the instruments boom and power system
18. Dec. 8 – **Linda (99603)** transmission switched to Iridium
19. Dec. 8 – **Lorne (99507)** try to fix wind and RH data transmission
20. Dec. 9 – **Lorne (99507)** fixed the program to have the right type of wind and RH sensor
21. Dec. 27 – **D-10 (8914)** raised, placed on sled, and fixed power system wiring by Philippe Dordhain
22. Jan. 5 – **D-47 (8916)** raised and installed new power system by Philippe Dordhain
23. Feb. 5 – **Dismal Island (8932)** replaced CR10X with CR1000 and new instrumentation by Rosey Grant and team
24. Mar. 4 – **Hugo Island (8935)** removed by UNAVCO
25. Apr. 26 – **Bonaparte Point (8921)** removed by ASC staff from Palmer Station

11/4/16: Twin Otter flight to Schwerdtfeger (SWT) AWS

Purpose: Raise

KBA Pilots: George and Alex

Boondogglers: Shaun (Crary Supply) and Charlie (VMF)

AWS Team: Lee and Carol

Unable to find AWS since we were using coordinates from 2003. Another attempt will be made using newer coordinates and ice movement calculations.

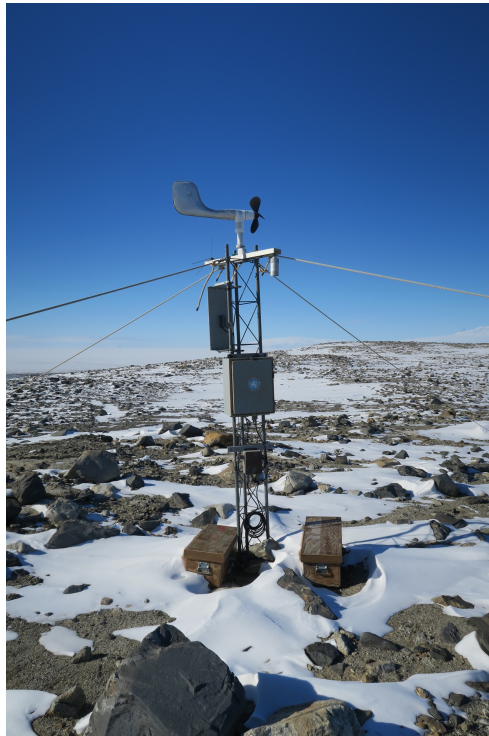
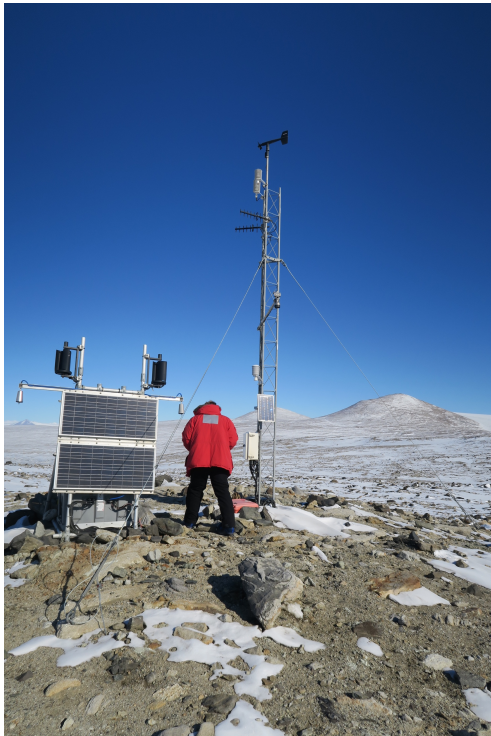
11/5/2016: Helo to Marble Point (MPT) and Marble Point II (MP2) AWS
Purpose: Check various parts of the AWS

Helo Pilot: Mike
AWS Team: Lee and Carol

1442: Depart Helo Pad
1515: Arrive MPT
All parts of both AWS looked like they were still in great shape!
1555: Depart MPT
1632: Arrive Helo Pad

Transport time: 1 hr. 10 mins.
Repair time @ MPT: 15 mins.

MP2 (left) and MPT (right) photos courtesy of Carol Costanza



11/7/2016: Drive to Pegasus North (PGN) AWS

Purpose: Remove the boom and enclosure in order to test the temperature sensor

AWS Team: Lee and Carol

1445: Depart Crary

1540: Arrive PGN

We were able to drive the truck up the road at the front of Pegasus runway. We only had to walk about 5 minutes out to the AWS. We then removed the enclosure and the boom from the tower and brought them back to the lab for testing.

1620: Depart PGN

1715: Arrive Crary

Transport time: 1 hr. 50 mins.

Repair time @ PGN: 30 mins.

11/8/2016: Helo to Cape Bird (CBD) AWS

Purpose: Replace the aerovane

Helo Pilot: Harlan

Boondogglers: Alicia (Hairdresser)

AWS Team: Lee and Carol

0920: Depart Helo Pad

0955: Arrive CBD

We replaced the aerovane, taped/wired the cabling, and checked the reading from the CR keypad. Lee noticed that the wind direction was backwards, so he had to change the wiring in the enclosure. The A red, wind wire was moved from VX2 to (ground) and the C yellow, wind wire was moved from (ground) to VX2, so the wires were switched in the enclosure. Then we wandered around the beach and waited for the helo for about 2 hours.

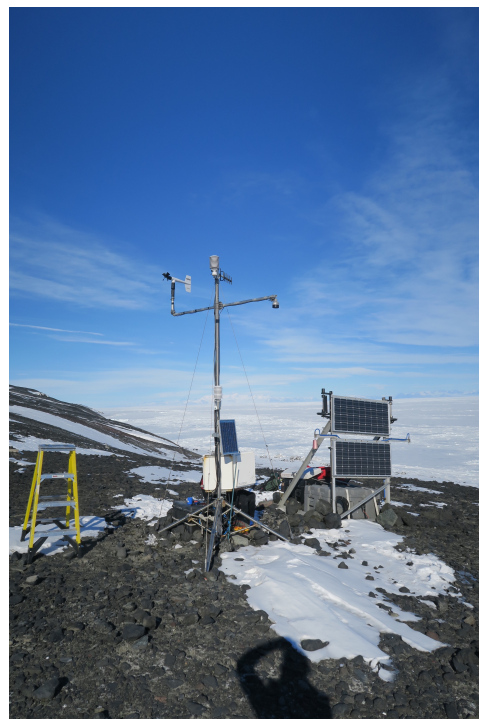
1313: Depart CBD

1350: Arrive Helo Pad

Transport time: 1 hr. 12 mins.

Repair time @ CBD: 1 hr.

CBD boom (left) and CBD in full (right) photos courtesy of Carol Costanza



11/9/2016: Helo to White Island (WTI) and Minna Bluff (MNB) AWS

Purpose: Check tower, and aerovane at WTI. Replace high wind speed sensor at MNB

Helo Pilot: Harlan

AWS Team: Lee and Carol

1330: Depart Helo Pad

1347: Arrive WTI

Tower, guy wires, and aerovane was inspected and looked correct. We did notice that the shields on both of the temperature sensors and the humidity sensors were chipped on the south side. It might be worth replacing the Gill shields at some point in the near future.

1422: Depart WTI

1447: Arrive MNB

We replaced the high wind speed sensor because last year we noticed it wasn't spinning very fluidly. The wind direction sensor was not replaced because we noticed it was still working correctly. The correct high wind speed sensor was a 2-pin sensor.

1510: Depart MNB

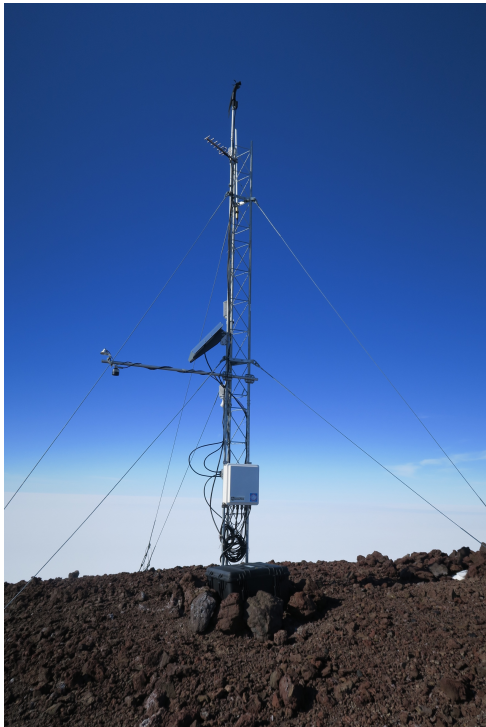
1548: Arrive Helo Pad

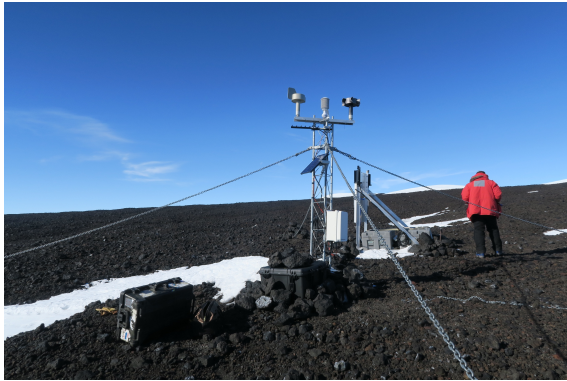
Transport time: 1 hr. 20 mins.

Repair time @ WTI: 30 mins.

Repair time @ MNB: 15 mins.

WTI (upper left), WTI sensor (upper right), MNB before (lower left), and MNB after (lower right) photos courtesy of Carol Costanza





11/15/2016: Helo to Laurie II (LR2) AWS

Purpose: Replace power system

Helo Pilots: Harlan and Josh

Boondogglers: Shaun (Crary Supply), Irene (Lodging), Carey (Waste), Rawq (Science Cargo)

AWS Team: Lee and Carol

1252: Depart Helo Pad

1330: Arrive LR2

First, we cut the cable for the old power system and removed the older solar panel with the junction box. Then we dug a small pit for the new power system and plugged the cables directly into the AWS2B. We tested transmission with the Telonics and it was successful!

1448: Depart LR2

1527: Arrive Helo Pad

Lee's phones coordinates: $-79^{\circ} 26.35'$ / $170^{\circ} 45.01'$ or $-79.439/170.750$

UNAVCO GPS setup for ~ 1 hour

$-77^{\circ} 26' 22''$ / $170^{\circ} 45' 01''$

-77.439 / 170.750

34 meters

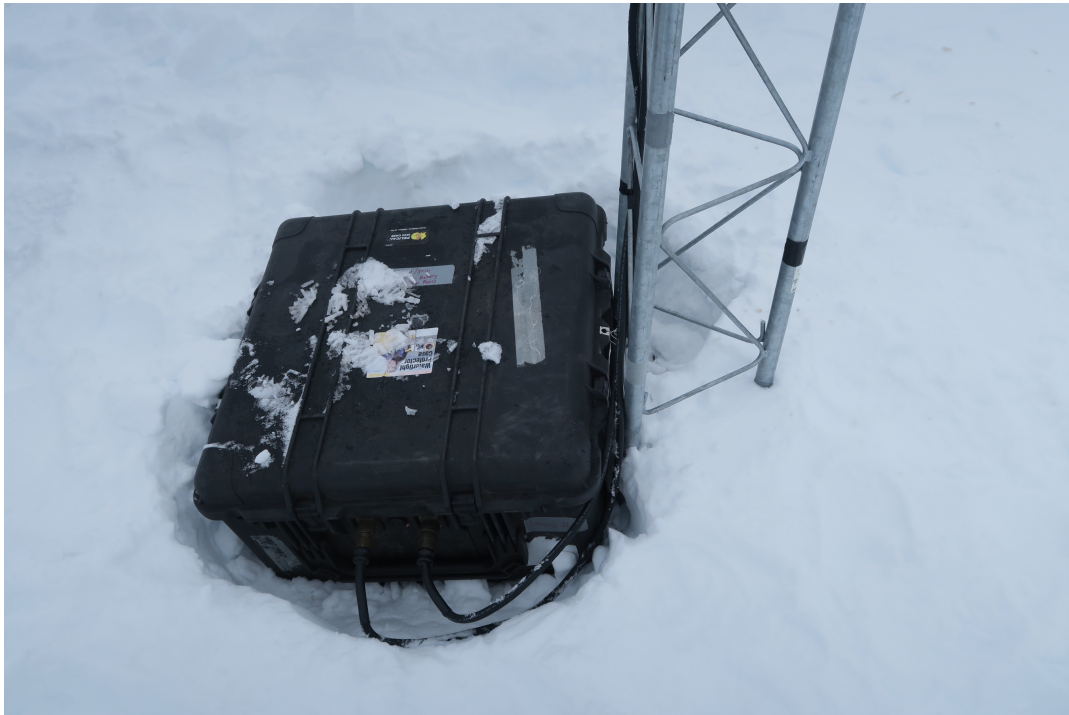
Heights from surface

Boom: 13 ft. 11 inches

Transport time: 1 hr. 17 mins.

Repair time @ LR2: 1 hr. 18 mins.

LR2 before (left), LR2 after (right), and LR2 power system (bottom) photos courtesy of Carol Costanza



11/16/2016: Twin Otter to Emma (EMA) AWS

Purpose: Replace power system

Twin Otter Pilots: Phil and Kelsey
Boondogglers: Beno (Cargo) and Jack (Supply)
AWS Team: Lee and Carol

0843: Depart WFD
1103: Arrive S+200 Fuel Cache
1145: Depart S+200 Fuel Cache
1303: Arrive EMA

We dug down about a foot to get the old batteries out. Then new batteries (still in briefcases) were installed and connected. We plugged everything back in and heard a transmission on the Telonics. Then Lee tightened the pole for the aerovane and various other bolts that had vibrated loose.

1405: Depart EMA
1623: Arrive WFD

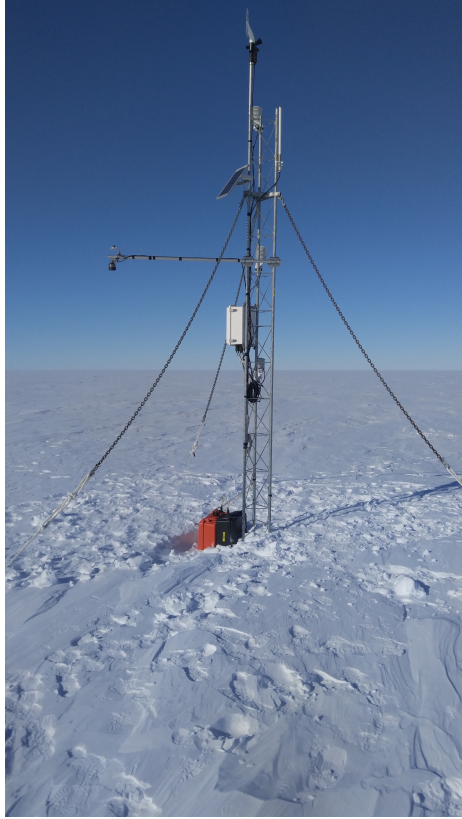
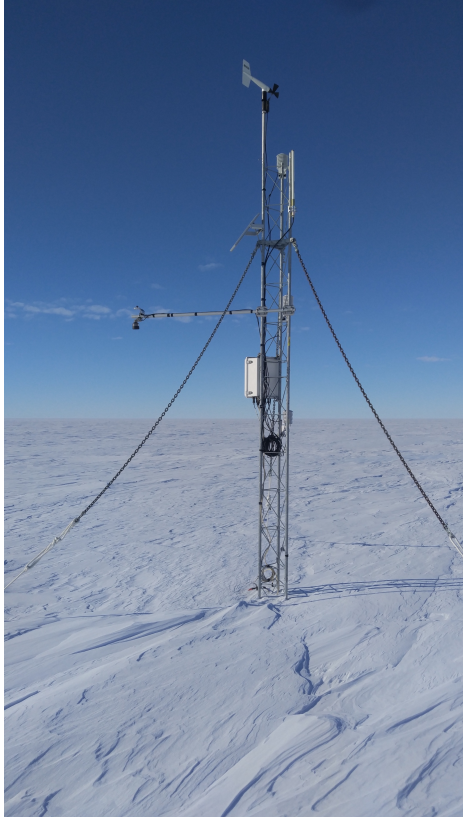
NOTE: For future visits to Emma make sure to check all bolts are tightened

UNAVO GPC setup for ~1 hour
-83° 59' 48" / 175° 02' 48"
-83.997 / 175.047
76 meters

Heights from surface
Lower Temperature: 5 ft. 9 inches
Enclosure: 7 ft. 10 inches
ADG and Solar Radiation: 9 ft. 9 inches
Humidity: 9 ft. 11 inches
Upper Temperature: 14 ft. 11 inches
Aerovane: 17 ft. 5 inches

Transport time: 6 hrs. 38 mins.
Repair time @ EMA: 1 hr. 2 mins.

EMA before (left), EMA after (right) photos courtesy of Lee Welhouse
EMA new power system (bottom) photo courtesy of Carol Costanza



11/19/2016: Twin Otter to Schwerdtfeger (SWT) AWS

Purpose: Raise the tower and batteries

Twin Otter Pilots: George and Alex

AWS Team: Lee, Dave, and Carol

1345: Depart WFD

Spent about 30 minutes searching for the AWS

1517: Arrive SWT

The batteries were raised to the snow surface and a 7 ft. tower section was added. We plugged everything back in and heard a transmission on the Telonics.

1800: Depart SWT

1855: Arrive WFD

Lee's phones coordinates: $-79^{\circ} 48.9657'$ / $170^{\circ} 21.395'$ or -79.816 / 170.3566

UNAVCO GPS setup for ~ 2.5 hrs.

$-79^{\circ} 48' 57''$ / $170^{\circ} 21' 27''$

-79.816 / 170.358

54 meters

Heights from surface before raise

Enclosure: 7 inches

Lower Temperature: 3 ft.

ADG and Solar Radiation: 4 ft. 4 inches

Humidity: 5 ft. 11 inches

Upper Temperature: 8 ft. 4 inches

Aerovane: 11 ft. 1 inch

Heights from surface after raise:

Enclosure: 5 ft.

Lower Temperature: 6 ft. 11 inches

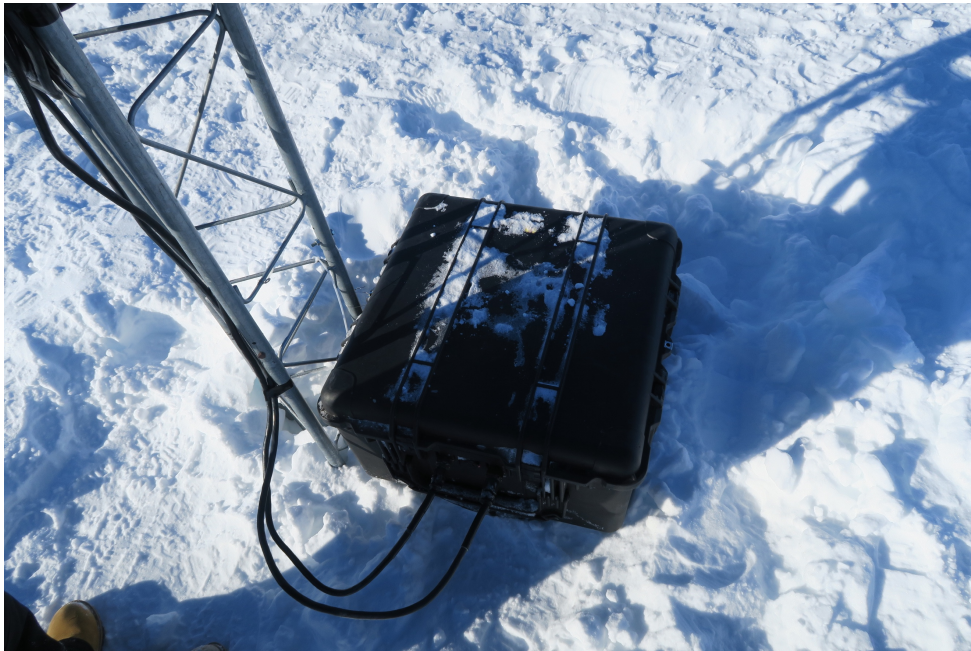
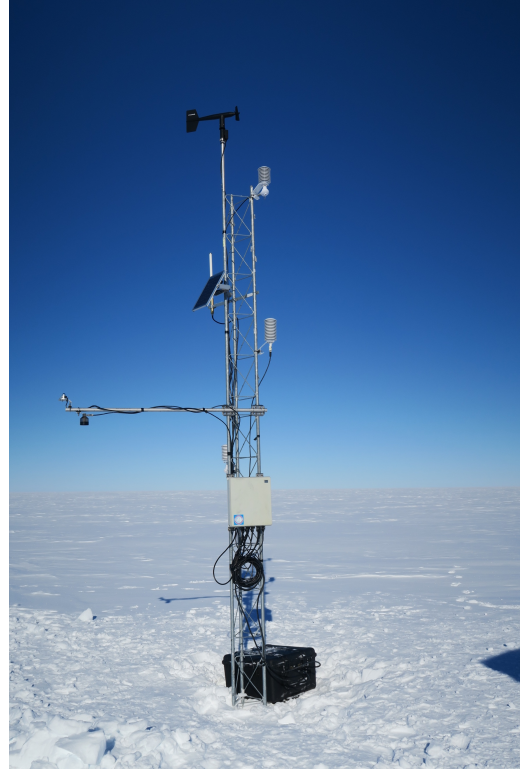
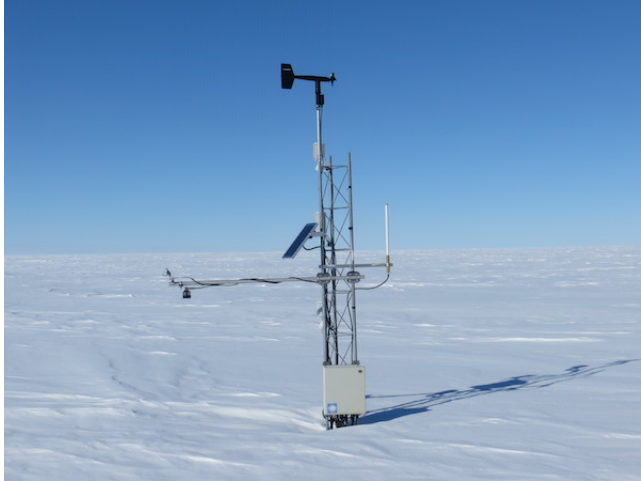
ADG and Solar Radiation boom: 8 ft. 5 inches

Relative Humidity: 10 ft. 7 inches

Upper Temperature: 15 ft. 9 inches

Aerovane: 18 ft. 2 inches

SWT before (left) (photo courtesy of Dave Mikolajczyk), SWT after (right), and SWT power system (bottom) (photos courtesy of Carol Costanza)



11/23/2016: Drive to Willie Field (WFD) AWS

Purpose: Raise Power System

AWS Team: Lee, Dave, and Carol

1410: Depart MCM

1430: Arrive WFD

We dug down about 4 feet to try and recover the power system. Unfortunately, we hit many thick ice layers. We determined the old battery boxes were unrecoverable. We will be going back later in the season to re-install a new 3-battery power system because a battery box wasn't available at the time.

1630: Depart WFD

1650: Arrive MCM

UNAVCO GPS setup for ~ 1.5 hrs.

-77° 52' 04" / 166° 55' 16"

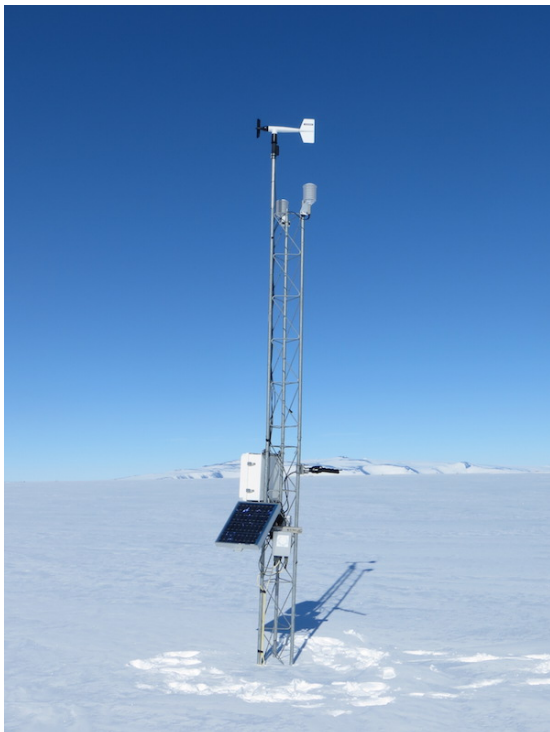
-77.868 / 166.921

9 meters

Transport time: 40 mins.

Repair time @ WFD: 2 hrs.

WFD upon arrival (Dave Mikolajczyk)



11/23/2016: Helo to Lorne (LRN) AWS

Purpose: Replace pressure sensor and solar panel

Helo pilot: John

AWS Team: Lee and Dave

2014: Depart McM

2046: Arrive LOR

Replaced the solar panel. Swapped the existing pressure sensor and installed a Paroscientific SN 62187 pressure gauge. We checked the pressure values but noticed they were incorrect. Back in McMurdo, Lee noticed the calibration values were entered incorrectly. After remotely updating the program with the correct values, the pressure is transmitting nominally. Tightened down the nut on the propeller, as it was loose. Should be something to check in future visits.

2206: Depart LOR

2238: Arrive McM

Instrument heights:

Enclosure: 2 ft. 7 inches

Lower temperature: 4 ft. 3 inches

Boom: 5 ft. (ADG -5", Pyra +5")

RH: 11 ft. 8 inches

Upper temperature: 12 ft.

Aerovane: 13 ft. 11 inches

UNAVCO GPS setup for ~ 1 hr.

-78° 11' 41" / 170° 01' 39"

-78.195 / 170.028

44 meters

Transport time: 1 hour 4 minutes

Repair time @ LOR: 1 hour 20 minutes

NOTE: Upon checking the data from LOR back in McM, we noticed the wind was transmitting zeros and the RH was too low. It is thought that some wiring was undone on the datalogger, so we need to revisit LOR this season.

LOR before (top) and after (bottom) (photos courtesy of Dave Mikolajczyk)



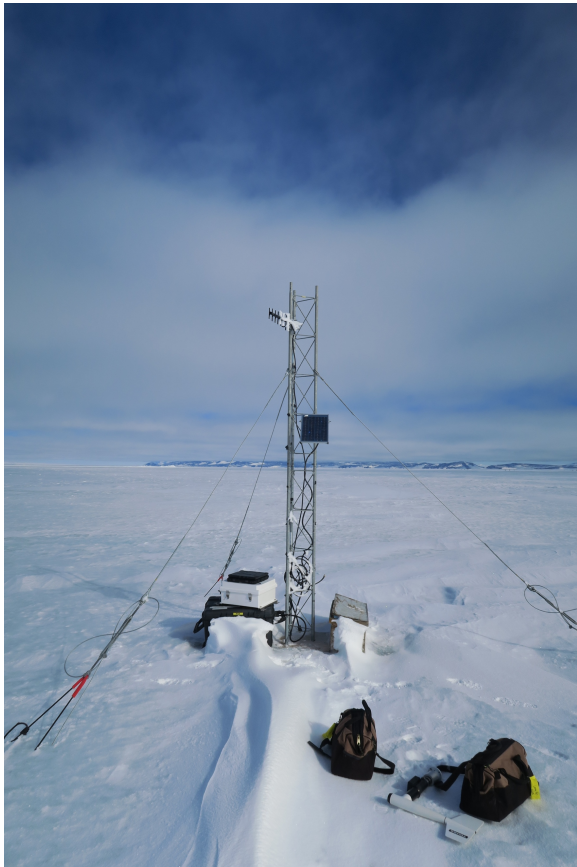
11/25/2016: Drive to Pegasus North (PGN) AWS

Purpose: Replace enclosure and instrument boom

AWS Team: Lee, Dave, and Carol

The enclosure and boom were replaced. The Argos antenna was removed from the instrument boom. Unfortunately, the Ethernet cable was not connected correctly. We'll need to go back to change the Ethernet port and restart the modem. The last old battery box was recovered from the site and brought to McMurdo.

PGN (before) and PGN (after) photos courtesy of Carol Costanza



11/25/2016: Snowmobile to Windless Bight (WDB) AWS

Purpose: Install a 3-battery power system at WDB and raise

AWS Team: Lee, Dave, and Carol

1138: Depart MCM

1225: Arrive WDB

An additional tower section was not needed. We first started to dig out the power system. It ended up being about 4 or 5 feet below surface after 2 years. The old 2-battery power system was returned to McMurdo, and the new 3-battery power system was installed. All of the instruments were raised except for the aerovane and the upper temperature sensor.

1620: Depart WDB

1710: Arrive WDB

Instrument heights before:

Lower temperature: -3 inches

Enclosure: snow surface

Boom: 2 ft. 1 inch (ADG -5", pyra +5")

RH: 4 ft. 10 inches

Upper temperature: 10 ft. 9 inches

Aerovane: 13 ft. 2 inches

Instrument heights after:

Lower temperature: 3 ft. 10 inches

Enclosure: 4 ft. 3 inches

Boom: 6 ft.

RH: 7 ft. 11 inches

Upper temperature: 10 ft. 8 inches

Aerovane: 13 ft. 2 inches

NOTE: The tower is tilting a fair amount. We should think about setting up a new tower next season. This would also be helpful because we can't remove the top pipe for the aerovane because the poles are cold welded. Finally, we might want to bring new quick connect wires for the power system. The third battery was directly wired without a plug.

UNAVCO GPS setup for ~ 4 hrs.

-77° 43' 42" / 167° 40' 33"

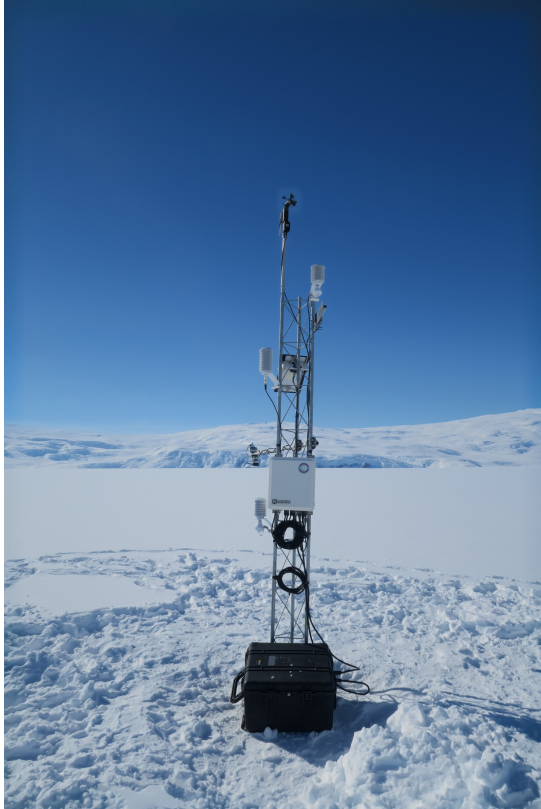
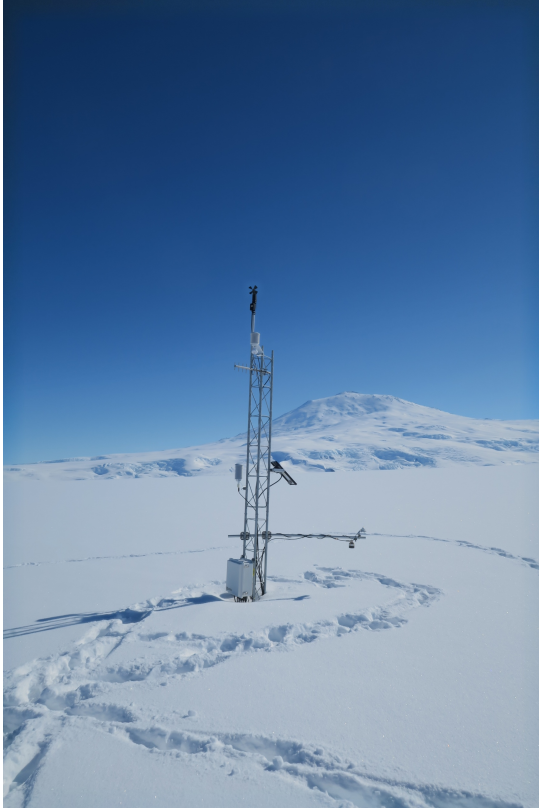
-77.728 / 167.676

40 meters

Transport time: 1 hr. 37 mins.

Repair time @ WDB: 3 hrs. 55 mins.

WDB before (left), WDB after (right), and WDB power system (bottom) photos courtesy of Carol Costanza



11/30/2016: Traverse to D-85 AWS

Purpose: Install a 2-battery power system at D-85 and raise

AWS Team: Philippe Dordhain

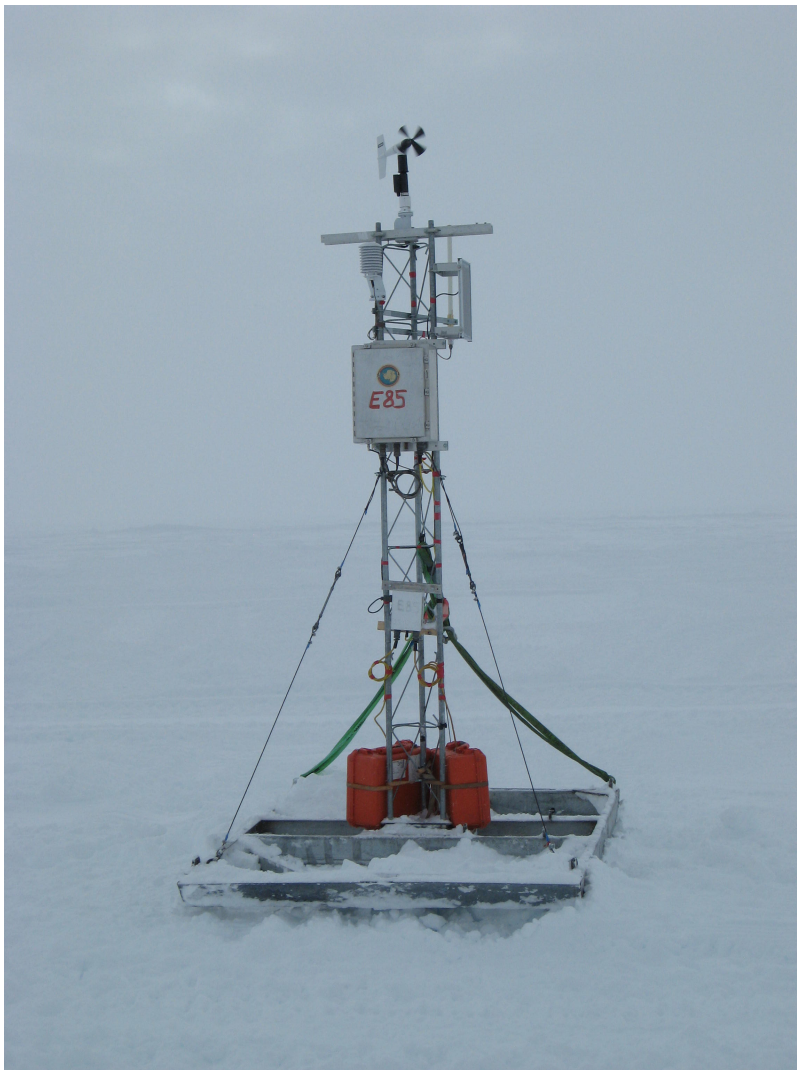
E85 AWS station has been maintained on the 30th of November 2016 during Dome C logistics traverse.

Batteries have been installed on the sled and now independent from external power

GPS coordinates 70° 25.540'S/134° 08.920'E

12.6 Volt

D-85 AWS photo courtesy of Philippe Dordhain



12/1/2016: Drive to Willie Field (WFD) AWS and Pegasus North (PGN) AWS

Purpose: Replace a 3-battery power system and solar panel at WFD and reconnect the Ethernet cable to the correct port at PGN

AWS Team: Lee, Dave, and Carol

We used a sled to push the 3-battery power system and tools out to WFD. Then we realized that we forgot the mount for the solar panel. Dave and Carol raised the Freewave antenna and removed the old solar panel and junction box. Lee drove to PGN while Dave and Carol were working on WFD. Lee switched the Ethernet cable from the blue port to the red Comm 2 port. PGN is now successfully transmitting again. We had to drive back into town to get the solar panel mount. Then Dave and Carol drove back to WFD and installed the new solar panel and got the power system all connected. By the time we got back to town, WFD was working again.

WFD after (top) and WFD power system (bottom) photos courtesy of Carol Costanza





12/3/2016: Twin Otter to Alexander Tall Tower! AWS

Purpose: Raise instrument booms to their original heights, raise power system, and install UNAVCO GPS sensor at the top of the tower

Twin Otter Pilots: Mike and Tyler
AWS Team: Lee, Dave, and Carol
ASC Riggers: Andrew, Emily, and John

0902: Depart WFD

0955: Arrive BAT

After 2 or 3 hours of digging, the power cable, power system, and solar panel tower were brought to the snow surface. Then the power system for the new UNAVCO GPS was left at the base of the tower. At the same time, the riggers worked to raise the instrument booms back to their original heights from 2011. Andrew and John climbed to the top of the tower to install the UNAVCO GPS and string down the cable. As they climbed down all the cables were secured to the tower with wire. Lastly, the last couple of instrument booms were raised and all the cables were plugged into the enclosure. The riggers did a great job helping us!

1738: Depart BAT

1814: Arrive WFD

Instrument heights before:

3rd boom from top: 110" = 9'2" ft. = 2.8 m

4th boom from top: 65" = 5'5" ft. = 1.7 m

5th boom from top: 48" = 4' ft. = 1.2 m

6th boom from top: 8" ft. = 0.2 m

Lower temperature: 2" ft. = 0.1 m

Instrument heights after:

1. Top tower and boom: 93 ft. or 28.3 m

2. 2nd boom from top: 49'2" ft. or 15.0 m

3. 3rd boom from top: 24'6" ft. or 7.5 m

4. 4th boom from top: 14'4" ft. or 4.4 m

5. 5th boom from top: 8'2" ft. or 2.5 m

6. ADG and antenna boom: 7'2" ft. or 2.2 m

7. 6th boom from top: 4'11" ft. or 1.5 m

8. Lower temperature: 4'11" ft. or 1.5 m

9. Bottom of enclosure: 2'6" ft. or 0.8 m

UNAVCO GPS setup for ~ 6 hrs.

-79° 00' 44" / 170° 43' 23"

-79.012 / 170.723

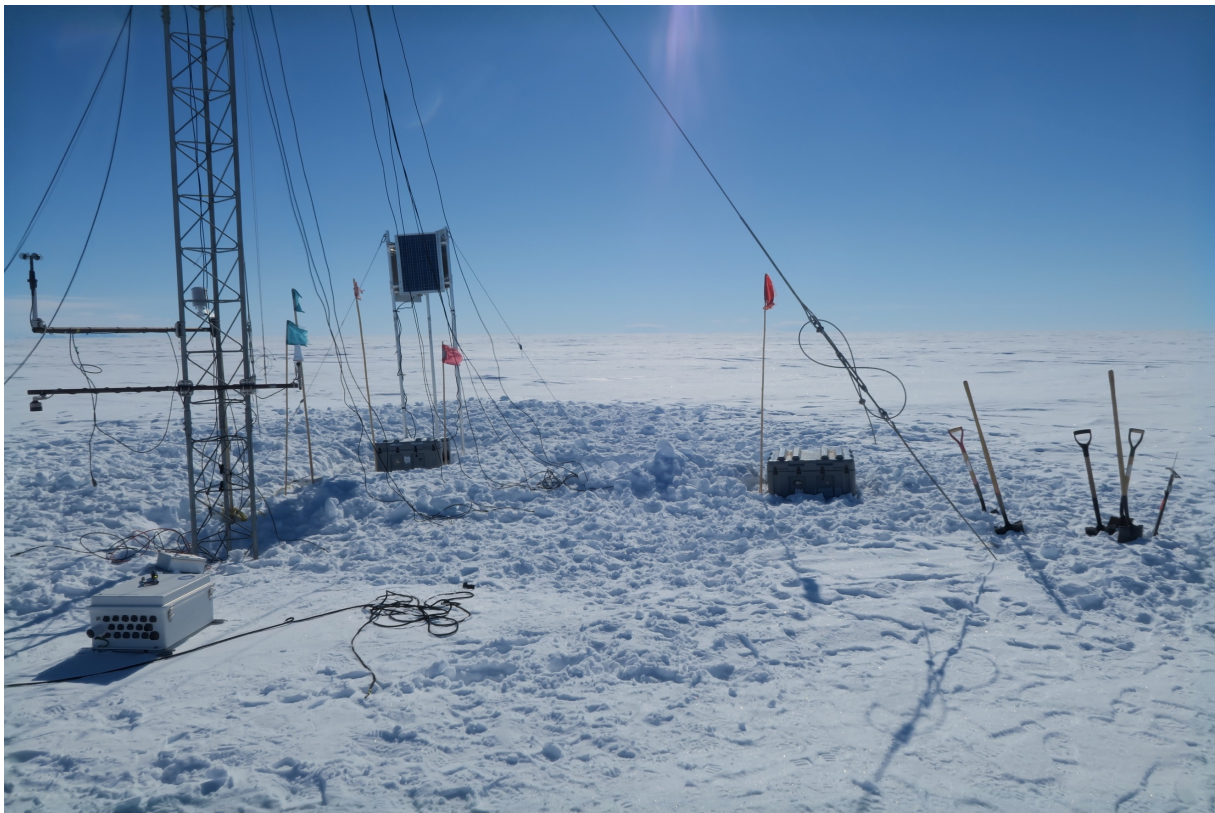
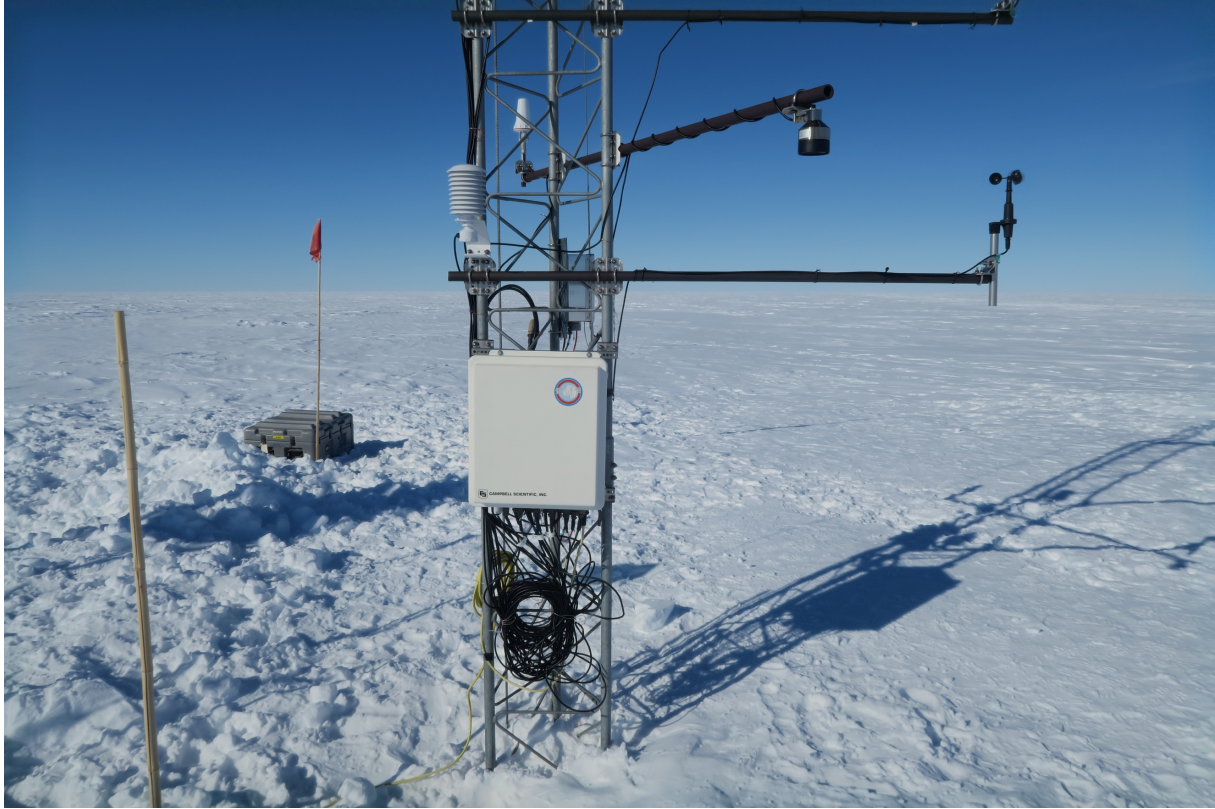
55 meters

Transport time: 1 hr. 29 mins.

Repair time @ BAT: 8 hrs.

BAT before (top left), BAT after (top right), BAT enclosure (2nd from top), BAT power system (2nd from bottom), and BAT GPS sensor (bottom) photos courtesy of Carol Costanza and David Mikolajczyk







12/8/2016: Helo to Linda AWS and Lorne AWS

Purpose: Change transmission type to Iridium at Linda AWS and check wiring at Lorne AWS

Helo Pilot: Barry

Boondogglers: Amanda (RIS project)

AWS Team: Lee and Carol

1149: Depart Helo Pad

1221: Arrive LDA

Lee worked to switch out the freewave modem for the iridium modem. Then Carol worked to switch out the freewave antenna for the iridium antenna. We got everything plugged in and the new cable coiled. Carol also took out the U-Bolt that was holding the solar panel and replaced it with a regular bolt. Lee called Dave to check for the iridium transmission the first time, and he hadn't gotten it yet. Then we waited another 10 minutes and it worked!

1318: Depart LDA

1338: Arrive LOR

Lee double checked the wiring, but the wind and RH sensors were still reporting incorrect values. Carol climbed up the tower to switch out the nose cone. Unfortunately, that didn't help either. We will be bringing a whole new aerovane out to the site again to see if that works.

1436: Depart LOR

1505: Arrive Helo Pad

UNAVCO GPS was setup for ~45 minutes at Linda

-78° 23' 39" / 168° 26' 47"

-78.394 / 168.446

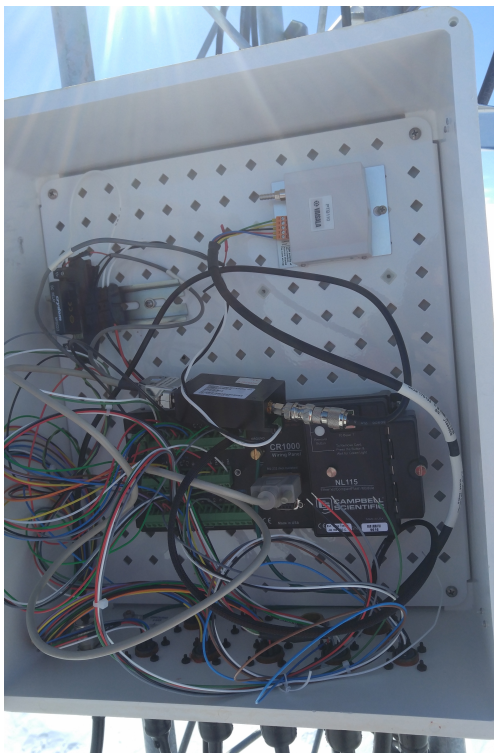
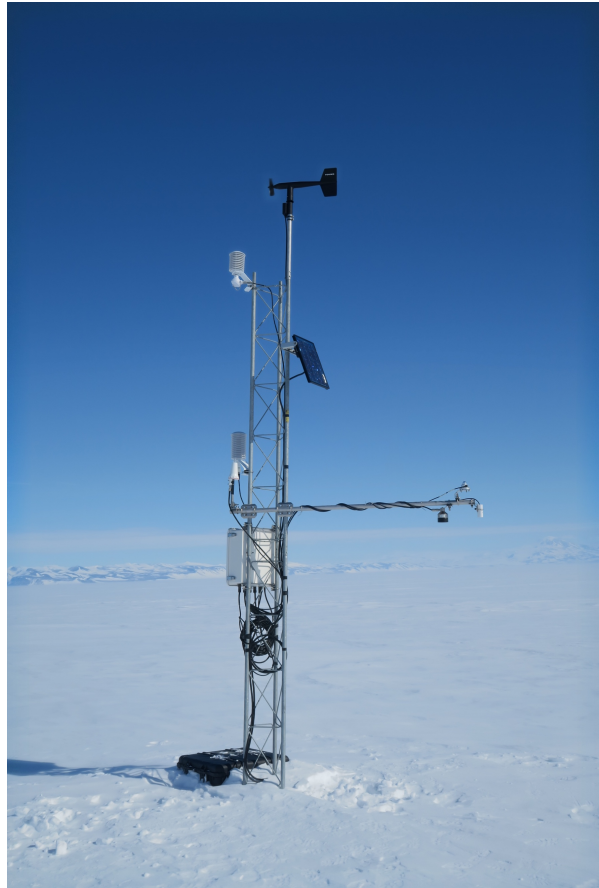
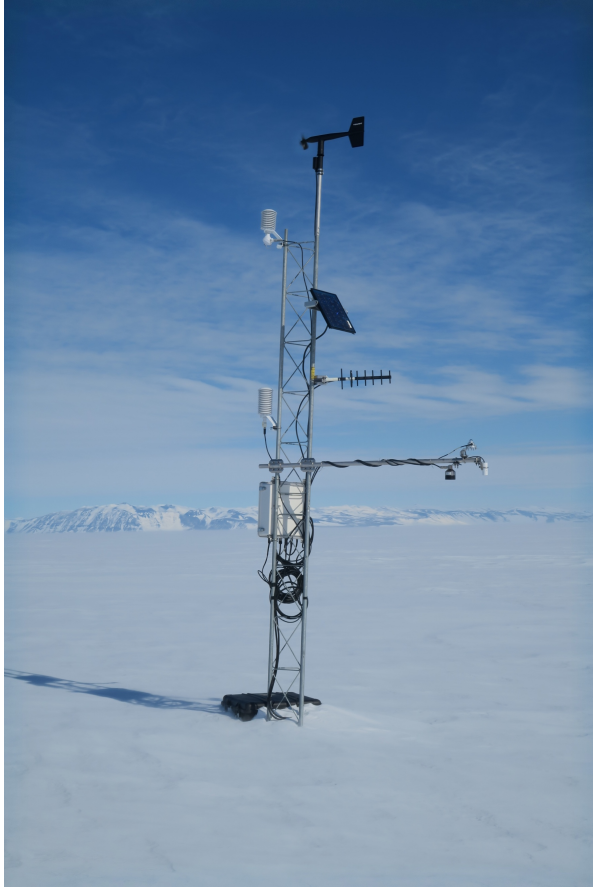
41 meters

New coordinates from Helo Pilot

LDA: -78° 23.64' / 168° 26.82'

LOR: -78° 11.66' / 170° 01.62'

LDA before (top left), LDA after (top right), and LDA inside enclosure (bottom) photos courtesy of Carol Costanza and Lee Welhouse



12/9/2016: Helo to Lorne AWS

Purpose: Check the aerovane sensor and figure out why the wind and RH sensors are reporting incorrect values

Helo Pilot: Mark (Kiwi pilot, flying A-Star IBR)

AWS Team: Lee, Dave, and Carol

1337: Depart Helo Pad

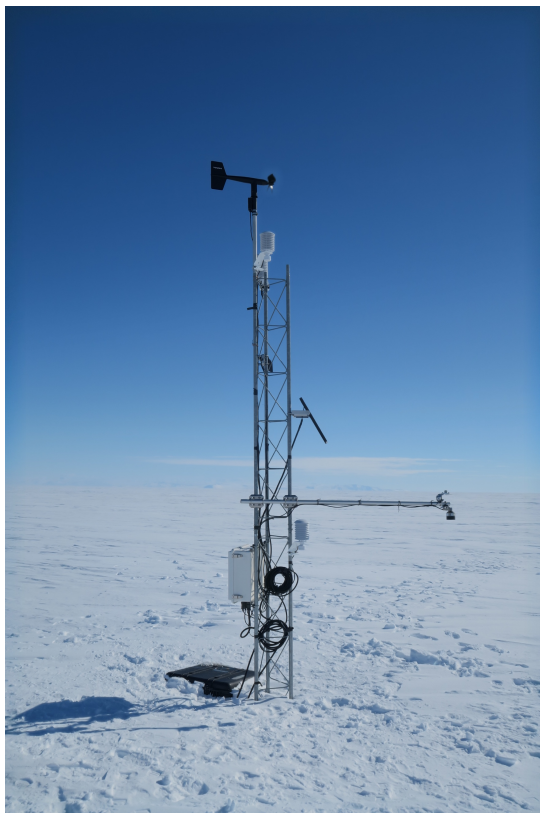
1405: Arrive LOR

We first tested the old aerovane with a volt-meter at the top, and it seemed like it wasn't working. Lee removed the aerovane. Then we compared the new and old aerovane and they seemed to be outputting the same values. Then we tested both plugs for the aerovane, and they both were outputting the same values through the CR1000 as well. From there, we knew it was either something wrong with the CR1000 or the program. Lee checked the new program that was installed for the new pressure sensor (which was installed earlier this year on Nov. 23), and he noticed the types for the wind sensor and RH sensor were incorrect. The program was edited, and then the CR1000 was reporting good wind and RH values.

1517: Depart LOR

1544: Arrive Helo Pad

LOR after photo courtesy of Carol Costanza



12/27/2016: Traverse to D-10 AWS

Purpose: Fix the wiring in the power system

AWS Team: Philippe Dordhain

D10 station has been retrieved and installed on sled at D10 the 27 December 2016 05 UTC. One of the batteries case was incorrectly wired after inspection. The solar panel steering diode was mounted the wrong way.

D10 has been disconnected on the 23rd of December, transported to the station, installed on its sled as well as reconnected to its own batteries.

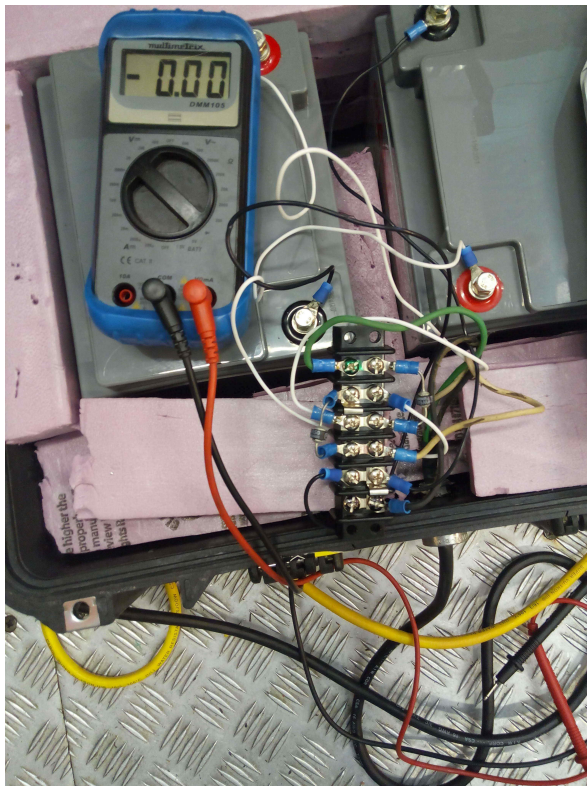
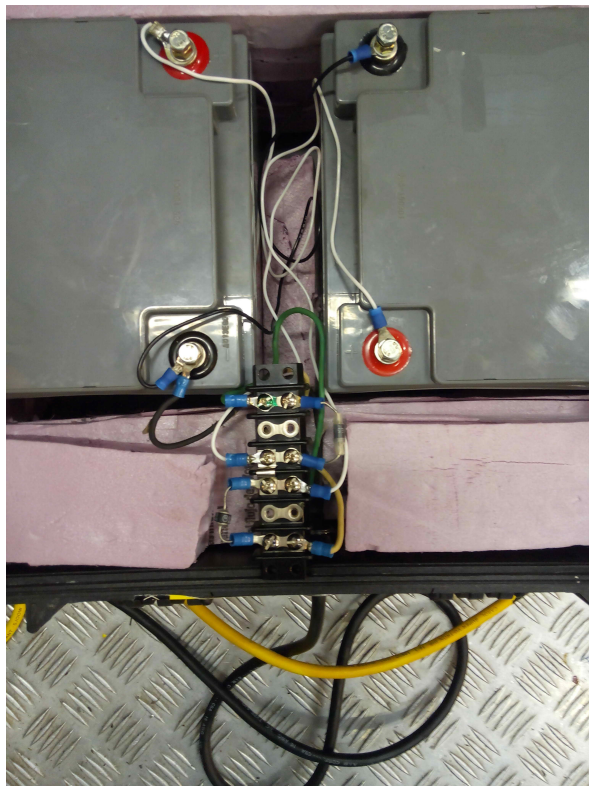
Data between the 23 rd and 27th of December would be wrong.

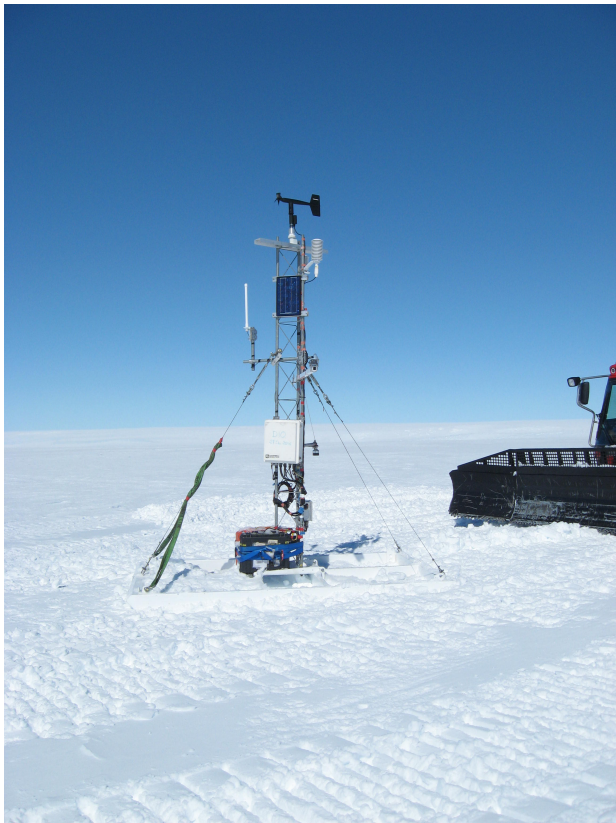
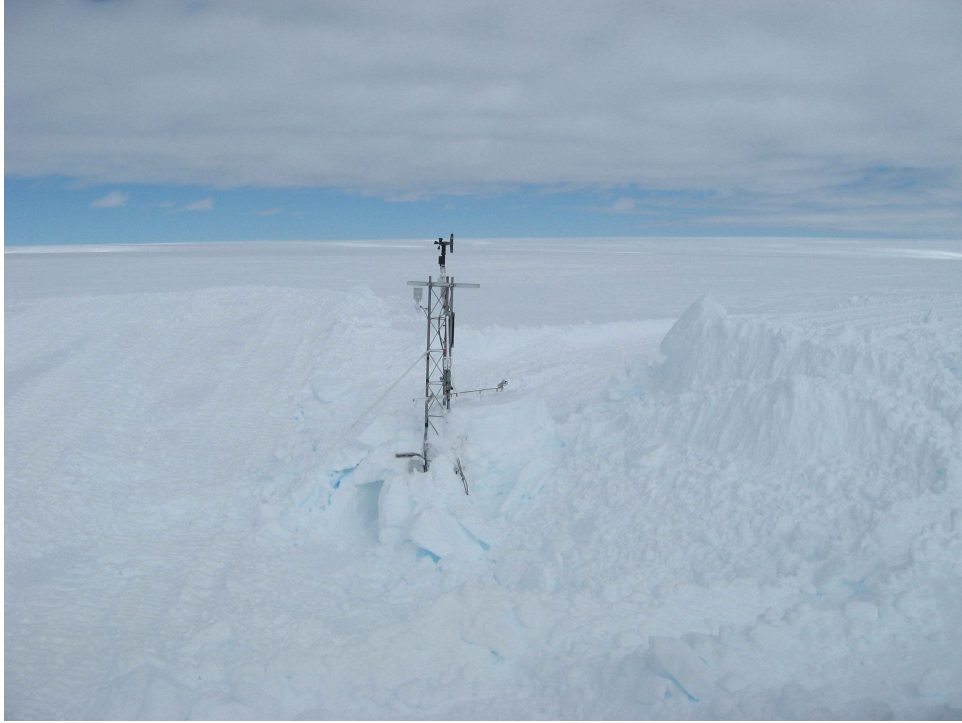
GPS: 66° 42.270' S /139° 50.483' E

Helio height: 2.1 metres

Snow sensor height: 1.18 metres

D-10 AWS photos courtesy of Philippe Dordhain





1/5/2017: Traverse to D-47 AWS

Purpose: Raise and install new power system

AWS Team: Philippe Dordhain

D47 has been disconnected at 0745 loc (UTC +10).
Batteries installed on the sled.

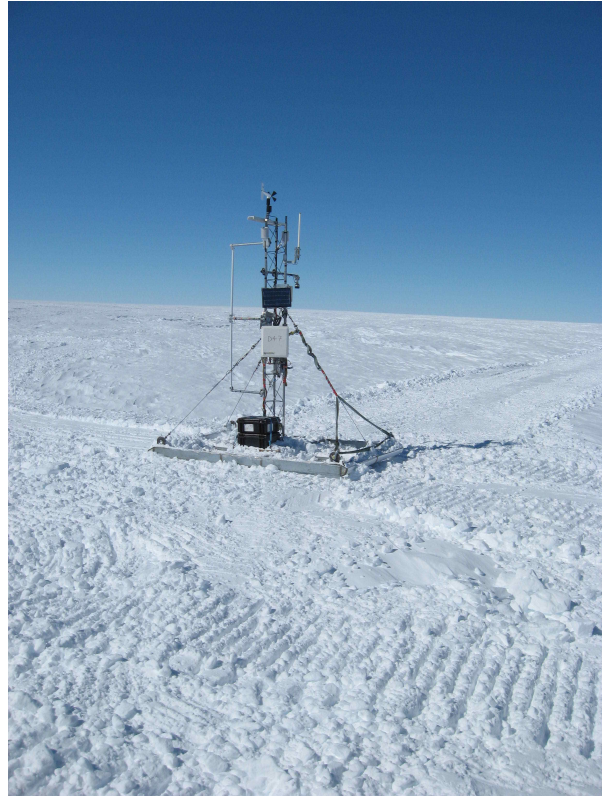
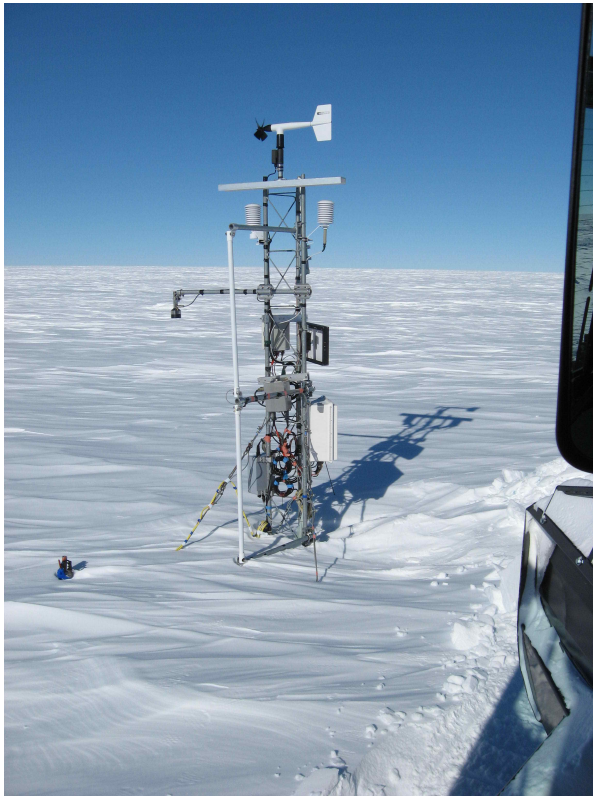
Station has been relocated and reconnected at 1000 loc (UTC +10).

D47 position is: 67° 23.085' S/138° 43.750' E

Flowcapt height: 0.8 metres

Snow sensor height: 2.3 metres

D-47 AWS photos courtesy of Philippe Dordhain



2/5/2017: Boat to Dismal Island AWS

Purpose: Replace CR10X with CR1000 and new instrumentation

AWS Team: Rosey Grant, John Law, Daze Routledge

Notes on arrival: The aerovane was missing its propeller. This was found in two pieces on the ground near the mast. Apart from the metal outer tube there was nothing left of the SR50. There were signs of corrosion and salt deposit on the logger box cable glands. All mast instrument attachments were very rusty. The battery box looked in good condition. The guys were rusty with some signs of damage but they were deemed safe. There was a redundant battery box left on the ground near the base of the mast. This was a wooden case with two very corroded batteries inside. (This was returned to Rothera where it was disposed of.)

Instrument Heights before:

Propvane: 310cm = 3.1 m = 10.2 ft.

SR50: 295cm = 2.95 m = 9.68 ft.

ARGOS antenna: 290cm = 2.9 m = 9.51 ft.

Solar panel: 238cm = 2.38 m = 7.81 ft.

Logger box: 125cm = 1.25 m = 4.1 ft.

Dump box: 75cm = 2.46 m = 2.46 ft.

The old instruments, solar panel, logger box and dump box were removed. All the U-bolts and attachments were severely rusted so they had to be cut (and bashed) to remove them from the mast. New instruments, ARGOS antenna, solar panel and logger box were attached, starting at the top and working down. The pipe supplied for mounting the propvane fitted over the leg of the mast but one of the bolts was too large for the hole so the pipe could only be secured with one bolt. Despite this, the mount felt secure.

Instrument Heights after:

Propvane: 355cm = 3.55 m = 11.6 ft.

HMP: 322cm = 3.22 m = 10.6 ft.

PRT: 322cm = 3.22 m = 10.6 ft.

ARGOS antenna: 294cm = 2.94 m = 9.6 ft.

Solar panel: 260cm = 2.60 m = 8.5 ft.

Logger box: 126cm = 1.26 m = 4.1 ft.

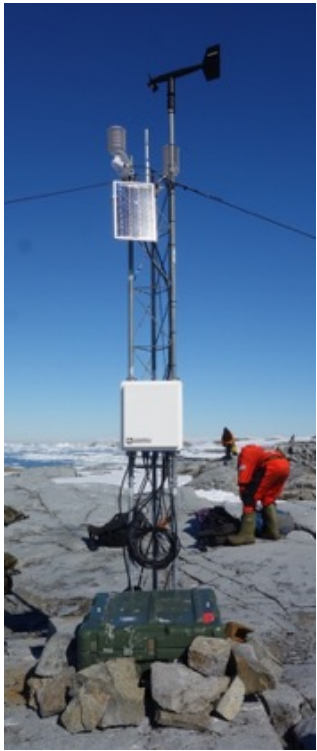
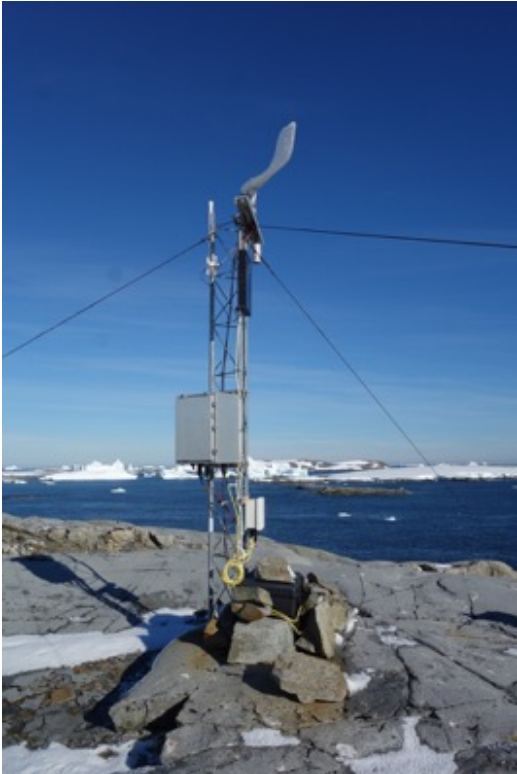
-68° 05' 16" / -68° 49' 35"

-68.088 / -68.826

12 meters

CR10X and extra instrument will be shipped back to Wisconsin this Spring/Summer

Dismal Photos Courtesy of Rosey Grant



3/4/2017: Boat to Hugo Island AWS

Purpose: Remove AWS at Hugo Island

AWS Team: 2 UNAVCO and maybe others??

AWS was very damaged and might not have lasted another year.

All instrumentation and equipment will be shipped back to Madison this Spring/Summer.

4/26/2017: Boat to Bonaparte Point AWS

Purpose: Remove AWS at Bonaparte Point AWS

AWS Team: ASC staff at Palmer Station

All instrumentation and equipment will be shipped back to Madison this Spring/Summer.
