

AWS Antarctic Field Season Visits 2015-2016

1. Oct. 26 – **Cape Hallett** (28388) first try at Iridium
2. Nov. 4 – **White Island** (99505) checked aerovane
3. Nov. 6 – Cape Hallett (28388) successfully switched to Iridium (300025010511860) A3LA-X
4. Nov. 7 – **Emilia** (8939) replaced aerovane
5. Nov. 7 – **Vito** (8986) power cycled and removed enclosure
6. Nov. 9 – **Ferrell** (8947) raised and removed data card
7. Nov. 12 – **Margaret** (8910) raised and new 2-battery power system
8. Nov. 14 – **Linda** (99509) first try at new power system and new pressure
9. Nov. 23 – Linda (99509) installed new 3-battery power and new pressure gauge
10. Nov. 27 – **Elaine** (21357) raised and installed new RH
11. Nov. 30 – Emilia (8939) got pressure gauge number
12. Nov. 30 – Vito (8986) re-installed electronics and power cycle... still no luck
13. Dec. 3 – **Byrd** (8903) raised
14. Dec. 4 – **Thurston Island** (8930) installed new RH
15. Dec. 9 – **Brianna** (8931) removed
16. Dec. 9 – **Erin** (21363) instrumentation raised
17. Dec. 10 – **Evans Knoll** (8923) removed of enclosure and bought back to WAIS
18. Dec. 12 – **Austin** (8901) installed
19. Dec. 13 – Evans Knoll (8923) re-installed enclosure with new pressure and solar panel
20. Jan. 9 – **Pegasus North** (99508) added 1 battery to power; remove 1 box of old batteries
21. Jan. 15 – **Harry** (8900) swapped AWS2B with a new AWSCR1000 and raised
22. Jan. 15 – Bryd (8903) fixed aerovane
23. Jan. 18 – **Theresa** (21358) power cycled and fixed connection from power to AWS2B
24. Jan. 18 – **Kathie** (8929) installed
25. Jan. 26 – **Siple Dome** (30393) Installed new tower and moved power station to snow level
26. Jan. 27 – Siple Dome (30393) finished moving all of the instrumentation onto the new tower
27. Jan. 28 – **Alexander TT!** (8987) riggers inspected the tower and junction box raised
28. Jan. 29 – **Laurie II** (21306) verified good batteries and power cycled
29. Jan. 29 – Ferrell (8947) took out the old data card and switched with a new data card
30. Feb. 5 – **Nascent** (28336) removed
31. Feb. 5 – Vito (8986) installed 8931 just an enclosure swap
32. Feb. 5 – Laurie II (21306) replaced the nose cone and prop
33. Feb. 8 – **Cape Bird** (99504) checked aerovane, will need to be replaced next year
34. Feb. 8 – **Minna Bluff** (99501) checked high wind speed sensor, will need to be replaced
35. Feb. 8 – **Marble Point** (99503) station inspected
36. Feb. 9 – **Lorne** (99507) raise lower instruments and installed new 3-battery power system
37. Feb. 12 – Pegasus North (99508) noticed the tower is tilted at about 45°
38. Feb. 26 – Pegasus North (99508) ASC fixed the tilting in PGN

Field Report 2015-16

AWS field Team 1 members: Dave Mikolajczyk and Mark Seefeldt

AWS field Team 2 members: Lee Welhouse and Carol Costanza

McMurdo Field Work: Team 1

10/26/15: Twin Otter flight to Cape Hallett AWS

Purpose: To convert transmissions from Argos to Iridium by installing Iridium 9602-N modem.

KBG: Pilots: Henry Perk and Shane Kelly

Boondogglers: Anne Hellie (Environmental Specialist), Nate Williams (Environmental Specialist), Ted Doerr (Environmental Specialist)

0855: Depart Willie Field (WFD)

1018: Arrive Cape Reynolds fuel cache

1050: Depart Cape Reynolds fuel cache

1235: Arrive CHA

Landed on sea ice, about a 20 minute walk from AWS. Brought a ladder along, but it was unnecessary, especially given the distance we needed to carry it. Swapped data cards. Removed Argos transmitter. Installed Iridium antenna on lower crossarm. Installed 9602-N Iridium modem. Called Dan Wagster back in McMurdo to verify email was sent. However, when we got back to McMurdo we found that no data was being sent in the email. The program was trying to send more data out than the 9602-N could handle, so it wasn't sending anything. We needed to go back to CHA to install a new modem, A3LA-X, and a new program.

1555: Depart CHA

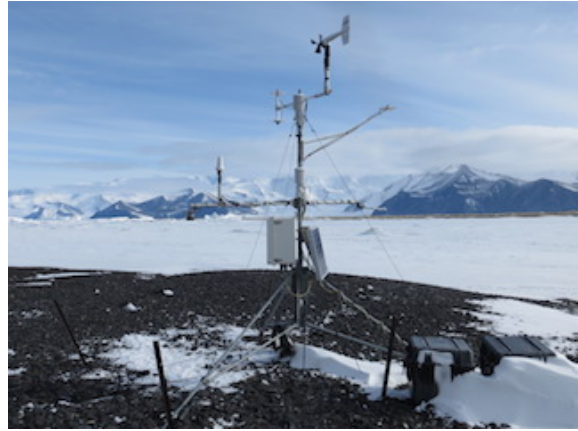
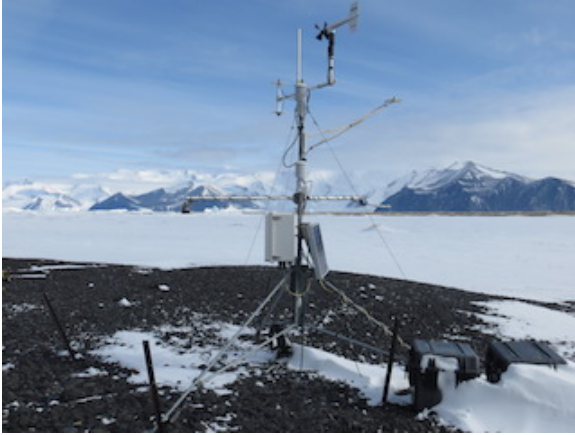
1733: Arrive Cape Reynolds fuel cache

1753: Depart Cape Reynolds fuel cache

1915: Arrive WFD

Transport time: 7 hrs.

Repair time @ CHA: 3 hrs. 20 mins.



CHA before (left) and after (right).

11/04/15: Helo to White Island AWS

Purpose: Station inspection. In particular, we wanted to make sure the anemometer wasn't damaged, given high wind speeds including a potential AWS record high wind speed in July 2015.

1214: Depart McMurdo

1230: Arrive Black Island

Dropped off Scott Gilbert, electrical technician

1235: Depart Black Island

1255: Arrive WTI

Station inspection. All instrumentation looked good. Swapped data cards. Weather was difficult to work in: winds were sustained around 15 kts, with gusts to 30 kts.

1345: Depart WTI

1405: Arrive McM

Transport time: 1 hr. 1 min.

Repair time @ WTI: 50 mins.



WTI

11/06/15: Twin Otter to Cape Hallett AWS

Purpose: To swap out Iridium modems 9602-N for the A3LA-X.

BBV: Pilots: Rob and Kelsey

Boondogglers: Cindy, Laura, Shandra

0825: Depart WFD

0940: Arrive Cape Reynolds fuel cache

1020: Depart Cape Reynolds fuel cache

1217: Arrive CHA

Landed on sea ice, about a 30 minute walk from AWS. We switched the 9602-N Iridium modem with the A3LA-X iridium modem and updated the program. The new modem is taped on the side wall inside the enclosure with black electrical tape. The new program has dialup capabilities. Dave called Lee back in Madison to verify the transmissions worked properly and data was being sent.

1525: Depart CHA

1715: Arrive Cape Reynolds fuel cache

1750: Depart Cape Reynolds fuel cache

1900: Arrive WFD

Transport time: 7 hrs. 27 mins.

Repair time @ CHA: 3 hrs. 8 mins.

11/07/15: Twin Otter to Emilia AWS and Vito AWS

Purpose: For EML, the anemometer installed in the 2014-15 field season was the incorrect anemometer, so we need to install the correct one. VTO isn't transmitting, so we will power cycle it to see if that works.

CKB: Pilots: Rodney and Sebastian

1057: Depart WFD

1140: Arrive EML

We installed the proper anemometer.

Instrument heights:

Boom: 147"

Enclosure (bottom): 56"

1230: Depart EML

1256: Arrive VTO

VTO wasn't transmitting, so we tried power cycling it but it still didn't transmit. We pulled the electronics to bring back to the lab to trouble shoot.

Instrument heights:

Boom: 164"

Enclosure (bottom): 57"

1338: Depart VTO

1451: Arrive WFD

Transport time: 2 hrs. 22 mins.

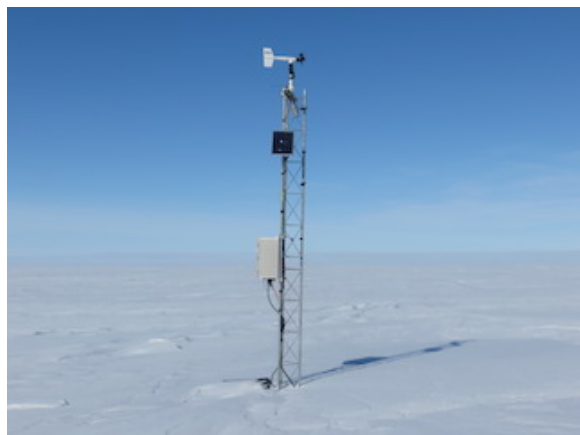
Repair time @ EML: 50 mins.

Repair time @ VTO: 42 mins.

Pilot coordinates @ EML: -78° 25' 33.06"S / 173 11' 06.18"E

Pilot coordinates @ VTO: -78° 24' 32.58"S / 177 49' 51.12"E

FOR FUTURE VISIT: The enclosure needs to be re-installed.



EML before (left) and VTO before (right)

11/09/15: Helo to Ferrell AWS

Purpose: Station raise

1220: Depart McM

1310: Arrive FER

Old instrument heights:

Wind: 137"

Upper Temp: 112"

RH: 109"

Boom w/ ADG and pyranometer: 74"

Enclosure: 34"

Lower Temp: 33"

Removed the instrumentation and installed a new tower section, then reinstalled instrumentation.

New instrument heights:

Wind: 223"

Upper Temp and RH: 191"

Enclosure: 83"

Boom w/ ADG and pyranometer: 74"

Lower Temp: 64"

1655: Depart FER

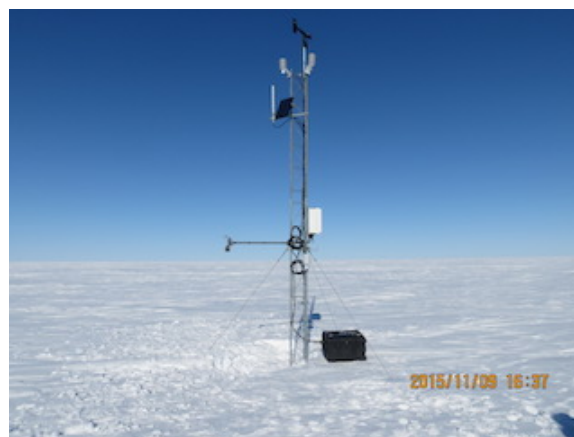
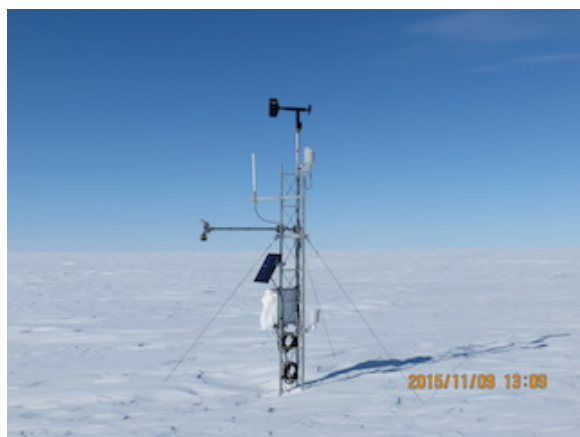
1730: Arrive McM

Transport time: 1 hr. 25 mins.

Repair time @ FER: 3 hrs. 45 mins.

UNAVCO coordinates @ FER: $-77^{\circ} 48' 12.16''S$ / $170^{\circ} 49' 02.80''E$

FOR FUTURE VISIT: We forgot to bring a new data card, and the handheld said the old datacard got corrupted due to turning the station off and on. For next visit, need to bring new data card and pull all data from data logger itself.



FER before (left) and after (right)

11/12/15: Twin Otter to Margaret AWS

Purpose: Raise the station and replace power system w/ 3 100-Ah batteries.

BBV: Pilots: Rob and Kelsey

0821: Depart WFD

1110: Arrive MGT

Old instrument heights:

Upper boom: Wind: 121", Temp: 111"

Lower boom w/ Temp and ADG: 81"

Enclosure: 55"

We removed the instrumentation, then installed a new tower section, reinstalled instrumentation and installed a new, 3 100Ah power system with power cable that goes into existing junction box. The battery box is on the side of the tower to the left of the enclosure, not directly beneath the enclosure.

New instrument heights:

Upper boom: Wind: 208", Temp: 198"

Enclosure: 122"

Lower boom w/ Temp and ADG: 81"

1500: Depart MGT

1621: Arrive Yesterday Camp to refuel

1650: Depart Yesterday Camp

1757: Arrive WFD

Transport time: 5 hrs. 47 mins.

Repair time @ MGT: 3 hrs. 50 mins.

Pilot coordinates @ MGT: -79° 58' 51.60"S / -165° 05' 54.60"W

UNAVCO coordinates @ MGT: -79° 58' 51.35"S / -165° 05' 58.05"W



MGT before (left) and after (right)

11/14/15: Helo to Linda AWS

Purpose: Station raise, check Paros pressure sensor because it wasn't transmitting, and install new, 3 100Ah power system.

Kiwi Helicopter IDE

0900: Depart McM

0927: Arrive LDA

It was windy when we landed, ~20 kts sustained, and got windier as our stay progressed, increasing to a sustained 25-30 kts, leading to a ground blizzard. We were unable to do all of the work due to the wind and blowing snow. The solar panel was dangling by its cable; it had come loose from the mount. We secured the panel with a u-bolt as the bolt for the side mount. We checked the pressure sensor issue by verifying the wiring connections looked good, but we did not go further in the check. We did not install the new power system, but we did leave it at the base of the station for the next visit. We determined that only the enclosure needed to be raised; the station height was sufficient for another 2 years, most likely.

Instrument heights:

Wind: 195"

Upper Temp: 161"

RH: 104"

Boom: 87"

Enclosure: 48"

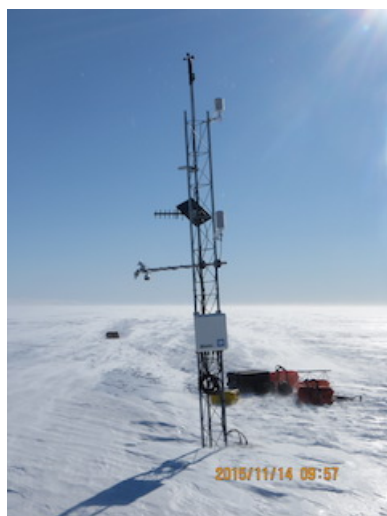
Program installed: Freewavelindav1.CR1

1230: Depart LDA

1300: Arrive McM

Transport time: 57 mins.

Repair time @ LDA: 3 hrs. 3 mins.



LDA before

11/23/15: Helo to Linda AWS

Purpose: Swap out Paroscientific pressure sensor with Vaisala PTB110 pressure sensor, and raise the enclosure.

2015: Depart McM

2050: Arrive LDA

Swapped out pressure sensor and verified it worked.

New enclosure height: 67"

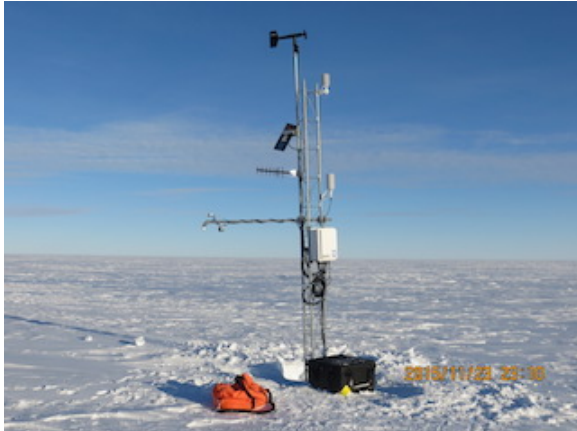
2315: Depart LDA

2345: Arrive McM

Transport time: 1 hr. 5 mins.

Repair time @ LDA: 2 hrs. 25 mins.

Pilot coordinates @ LDA: $-78^{\circ} 23' 54.00''S$ / $168^{\circ} 26' 31.20''E$



LDA after

11/27/15: Twin Otter to Elaine AWS

Purpose: Station raise

KBG: Pilots: Henry and Shane

0935: Depart WFD

1202: Arrive ELN

Old instrument heights:

Wind: 63"

Upper temp: 26"

Boom with ADG: 21"

The lower temperature sensor and the batteries were buried too deeply, so they were unable to be recovered. We swapped RH sensors, so the new RH is an HMP45A. The old one was buried and the radiation shield was busted. The anemometer pipe bolt didn't fit through the holes to secure to the tower section, so we used wire and electrical tape to secure it.

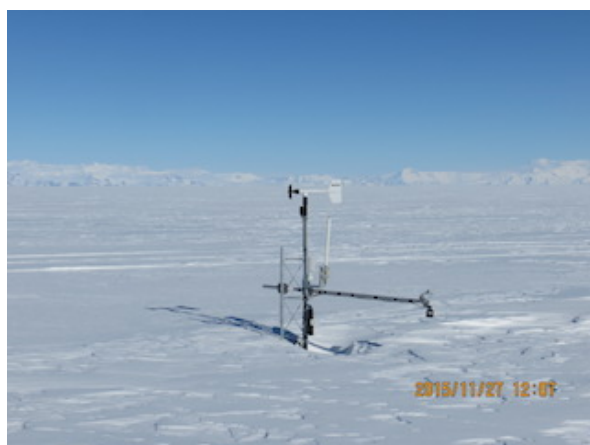
1630: Depart ELN

1834: Arrive WFD

Transport time: 4 hrs. 31 mins.

Repair time @ ELN: 4 hrs. 28 mins.

FOR FUTURE VISIT: For the power system, either extension cables will be needed to extending the existing battery cables, or a new power system will be needed, as the existing batteries are unrecoverable.



ELN before (left) and after (right)

11/30/15: Twin Otter to Vito and Emilia AWS

Purpose: To reinstall electronics box and replace the power system at VTO, and to check the serial number on the pressure sensor at EML.

KBG: Pilots: Henry and Shane

0815: Depart WFD

0918: Arrive VTO

We reinstalled the electronics box and replaced the power system but kept the existing solar panel.

1030: Depart VTO

1100: Arrive EML

Removed the AWS electronics, opened the electronics and determined the Paroscientific pressure sensor serial number is 34191, reinstalled the AWS electronics.

1127: Depart EML

1205: Arrive WFD

Transport time: 2 hrs. 11 mins.

Repair time: 1 hr. 39 mins.



VTO (left) and EML after (right)

WAIS Field Work: Team 1

12/03/15: Twin Otter to Byrd AWS

Purpose: Station raise

KBH: Pilots: Troy and John

0950: Depart WSD

1021: Arrive Byrd Field Camp

Dropped off gear and cargo from WAIS for the camp personnel. Taxied over to BYD AWS.

1052: Arrive BYD

We added one 7' tower section and reinstalled the instrumentation. We swapped the data card.

Old Instrument Heights:

Wind: 164"

RH: 115"

Upper temp: 113"

Lower temp: 57"

Boom w/ ADG and pyranometer: 50"

Enclosure: 13"

New Instrument Heights:

Wind: 256"

Upper temp: 222"

RH: 222"

Enclosure: 107"

Lower temp: 97"

Boom w/ ADG and pyranometer: 97"

1433: Depart BYD

1510: Arrive WSD

Transport time: 1 hr. 39 mins.

Repair time @ BYD: 3 hr. 41 mins.

UNAVCO coordinates @ BYD: -80° 00' 40.69"S / -119° 26' 16.27"W



BYD before (left) and after (right)

12/04/15: Twin Otter to Evans Knoll AWS and Thurston Island AWS

Purpose: At EKN, fix the anemometer and pressure gauge. At THI, fix the anemometer and RH sensor.

KBH: Pilots: Troy and John

Pax: Paul Koubek (mountaineer), John Stone (geologist, I-277)

0855: Depart WSD

1110: Reach EKN. Fly over it, but too much flat light to land.

1124: Heading to THI

1234: Arrive THI

We replaced the nose cone and propeller on the anemometer. The old nose cone was gritty and wouldn't rotate properly. We replaced the existing RH sensor (HMP45C) with the RH sensor and busted shield pulled from ELN (HMP155). We had to use some electrical tape to ensure the RH sensor would stay in the RH shield. We adjusted the program, BEAR.CR1, to accommodate the new RH sensor. We swapped the data card.

Program running on THI: BEAR.CR1

1432: Depart THI

1800: Arrive WSD

Transport time: 7 hrs. 27 mins.

Repair time @ THI: 1 hr. 58 mins.

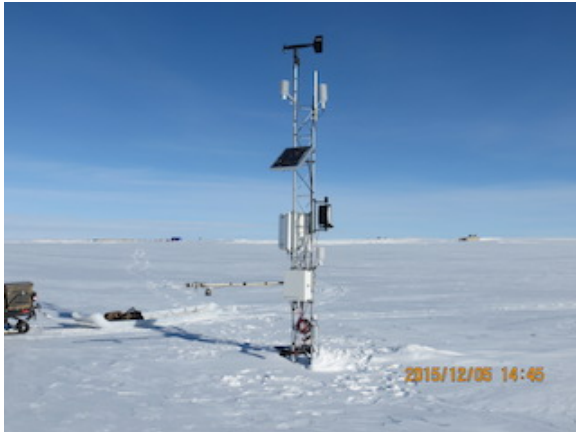


THI before (left) and after (right)

12/05/15: Snowmobile to Kominko-Slade AWS

Purpose: Possible station raise

We checked out the station, but it didn't seem critical that it needed to be raised. It did not need a new tower section. We swapped out the data card. It may be useful to raise the lower instrumentation later this field season.



KMS

12/09/15: Twin Otter to Brianna AWS and Erin AWS

Purpose: To remove BRI and possibly raise ERN.

KBH: Pilots: Troy and John

Pax: Paul Koubek (mountaineer) and Joel Gombiner (geologist, I-277, boondoggle)

0951: Depart WSD

1200: Arrive BRI

We removed all instrumentation, the battery box, and the top tower section.

1313: Depart BRI

1350: Arrive ERN

The station is plenty tall and doesn't need a new tower section. We just raised the enclosure and put the lower temperature sensor beneath the enclosure. We swapped the data card.

Old Instrument Heights:

Wind: 234"

Upper temp: 200"

RH: 139"

Lower temp: 87"

Enclosure: 46"

New Instrument Heights:

Enclosure: 72"

Lower temp: 54"

1500: Depart ERN

1747: Arrive WSD

Transport time: 5 hrs. 33 mins.

Repair time @ BRI: 1 hr. 13 mins.

Repair time @ ERN: 1 hr. 10 mins.



BRI before (left) and after (right)



ERN before (left) and after (right)

12/10/15: Twin Otter to Evans Knoll AWS

Purpose: To fix the anemometer and the pressure sensor.

KBH: Pilots: Troy and John

Pax: Paul Koubek (mountaineer), John Stone (geologist)

0920: Depart WSD

1140: Arrive EKN

We replaced the nose cone and propeller on the anemometer, as both were missing. The solar panel was completely missing, but the mount was still attached to the tower. The battery voltage for the batteries was at 11.5 V. The pressure sensor had good voltages for the wire connections in the enclosure (11.36 V) but was still not transmitting. To preserve the life of the batteries and diagnose the pressure issues, we removed the enclosure to bring back to the lab.

Program running on EKN: THURST.CR1

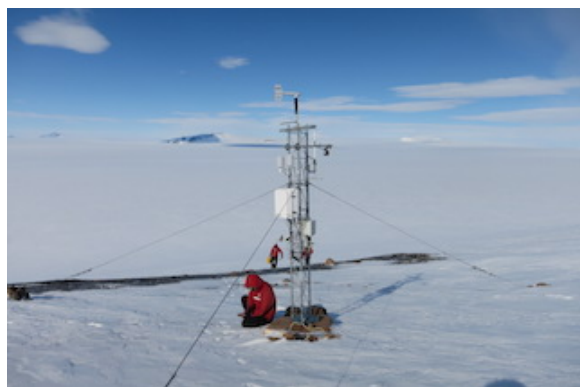
1337: Depart EKN

1555: Arrive WSD

Transport time: 4 hrs. 38 mins.

Repair time @ EKN: 1 hr. 57 mins.

FOR FUTURE VISIT: Reinstall enclosure, and bring new solar panel to reinstall which needs to be spliced with the plug that fits into the junction box at EKN.



EKN before (left) and after (right)

12/12/15: Twin Otter to install Austin AWS

Purpose: Installation of Austin AWS (Argos 8901)

KBH: Pilots: Troy and John

Pax: Catherine Dudley (WAIS medic)

1108: Depart WSD

1353: Arrive ATN

In order to determine true South, we asked Troy to use the plane skis to draw a line oriented North-South. He did that and parked the plane so the front was facing directly true South.

We used two tower sections: one 10' and one 7'. We put these together on the ground while the base hole was being dug. There is no baseboard, so the base hole was dug ~2' deep instead of 1'.

Once the hole was ready and tower sections were connected (guy wires already attached), we propped the tower on a couple cases so we could install the instrumentation easily. We installed everything except the ADG and pyranometer boom, as that was installed after the tower was lifted and secured in the snow.

Once the instruments were installed, we raised the tower into the hole, then filled it. Then we dug holes for the dead men, connected the guy wires to them, then buried them in the holes. We verified the station was level and plumb.

With the station raised, we installed the instrument arm.

The power system has a fuse box, but there were no fuses and we couldn't scrounge any up, so we used wire to bridge the connections in the fuse box. There is a charge controller in the power system.

We verified the data looked good and used the Telonics to verify the data transmitted.

Instrument heights:

Wind: 207"

Upper temp: 176"

RH: 176"

Enclosure: 99"

Boom w/ ADG and Pyranometer: 88"

Lower temp: 57"

NOTE: There is no baseboard. There weren't fuses in the fuse box, so we used wire to bridge the connection. Upon installing the upper temperature sensor, the black piece of plastic on the mount cracked in half (most likely due to over-tightening).

1726: Depart ATN

1958: Arrive WSD

Transport time: 5 hrs. 17 mins.

Repair time @ ATN: 3 hrs. 32 mins.

ATN

12/13/15: Twin Otter to Evans Knoll AWS

Purpose: To reinstall electronics with new pressure gauge (from new Harry CR1000, which was yet to be installed) and replace the missing solar panel.

KBH: Pilots: Troy and John

Pax: Anne Beaulaurier (WAIS camp supervisor), Kristen Vawter (chef), Kevin Tarbell (mechanic)

1323: Depart WSD

1554: Arrive EKN

We reinstalled the electronics, which included a swap out of the pressure gauge. We swapped EKN's bad pressure gauge with the gauge destined for Harry. We also installed the solar panel that we recovered from the Brianna uninstal. We verified good data and transmissions.

1722: Depart EKN

1935: Arrive WSD

Transport time: 4 hrs. 44 mins.

Repair time @ EKN: 1 hr. 28 mins.



EKN after

McMurdo Field Work: Team 2

1/9/16: Drive to Pegasus North AWS

Purpose: To add new 3-battery power system, and check the wiring for the temperature sensor.

PAX: Tricia Hall (POLENET)

1120: Depart Crary Phase II

1225: Arrive Pegasus Airfield

It took about 20 minutes to find where the Pegasus North AWS was located. It's currently to the left of the airfield facility as you approach the runway; southeast of the facilities. We drove as close as we could to the AWS, but we still had to park about 150 feet away. The temperature sensor wiring was checked, and it looked correct. A new 3rd battery was added to the power system. The power system now has 3 batteries; 2 old and 1 new.

Unfortunately, the tower is tilted a lot, so we might need to make another trip back with the riggers. One of old wooden boxes of batteries was recovered and brought back to Crary.

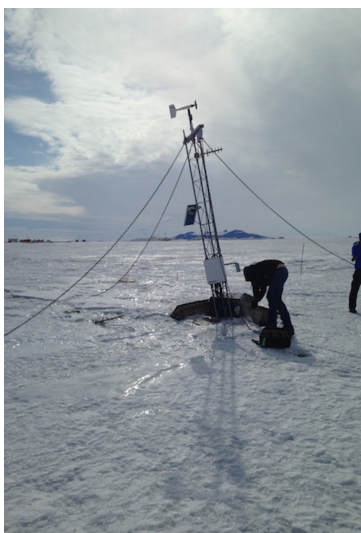
1328: Depart Pegasus Airfield

1426: Arrive Crary Phase II

Transport time: 2 hrs. 3 mins.

Repair time @ PGN: 1 hr. 3 mins.

PGN (left)



WAIS Field Work: Team 2

1/15/16: Twin Otter to Harry AWS and Byrd AWS

Purpose: Swap out AWS2B for AWSCR1000 instrumentation for Harry, and fix the aerovane at Byrd

KBH: Troy and Simon

PAX: Jonathan Wille (WSD Weather observer) and Ryan Scott (AWARE)

0815: Depart WSD

0951: Arrive HRY

We quickly decided not to try and recover the batteries, but we did dig down to recover the junction box. We then removed all of the other old AWS2B instrumentation. Lee added a 7 ft tower section and it was secured with a cargo strap since the new tower wasn't far enough down to secure it with the bolts. Then all of the new AWSCR1000 was installed. The ADG wasn't installed because there was no horizontal bar. There also wasn't a humidity sensor available. All cables were plugged in and we verified transmission with the Teleonics.

Instrument Heights:

Wind: 212"

Upper Temp and Pyranometer: 185"

Lower Temp: 73"

Enclosure: 43"

1220: Depart HRY

We tried to fly to TRS, but it was too socked in to land. Then we turned around and went to BYD.

1515: Arrive BYD

First, we got some fuel and took a tour of Byrd Station, and then we taxied over to the AWS. Lee figured out the issue with the aerovane. The windspeed cable was too tight and Lee was able to figure it out!

1615: Depart BYD

1705: Arrive WSD

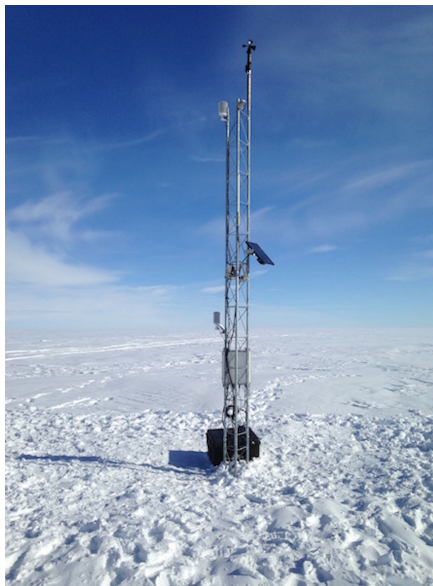
Transport time: 5 hrs. 21 mins.

Repair time @ HRY: 2 hrs. 29 mins.

Repair time @ BYD: 1 hr.

Pilot coordinates @ HRY: -83° 00' 17.40"S / -121° 24' 24.00"W

HRV before (left) and HRV after (right)



1/18/16: Twin Otter to Theresa AWS and Kathie AWS

Purpose: Check Power at Theresa and install Kathie

KBH: Troy and Simon

PAX: Tricia Hall (POLENET) and Cat (WSD Weather Observer)

0804: Depart WSD

1008: Arrive TRS

Lee checked the battery voltage and solar panel voltage, and both looked fine. We decided it didn't need new batteries, so Lee began to check the connections. He concluded that the power supply cable to the AWS2B had a bad connection. The system was power cycled and we verified transmission with the Teleonics.

1103: Depart TRS

1425: Arrive KTH

Great installation of the tower with the guy wires. The team worked very well together to put up the tower. The aerovane is very tightly on the tower. All instruments were put on the tower and the installation took about 3 hours. After everything was plugged in we verified transmission with the Teleonics.

Wind: 232"

Upper Temp: 196"

Humidity: 146"

ADG and pyranometer: 118"

Lower Temp: 88"

1725: Depart KTH

We stopped at a fuel cache on the way back and took on 4 barrels of fuel.

2015: Arrive WSD

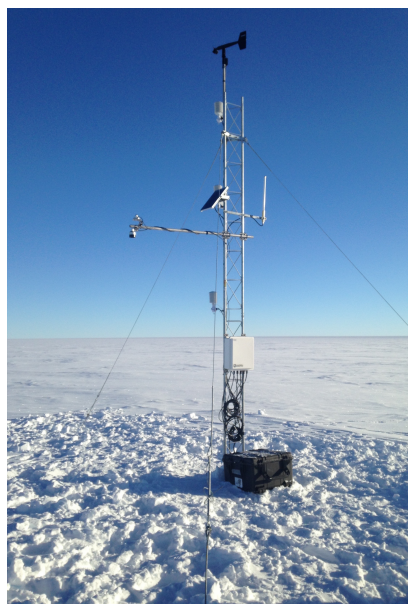
Transport time: 8 hrs. 16 mins.

Repair time @ TRS: 55 mins.

Repair time @ KTH: 3 hrs.

NOTE: The extra power system that is left at WSD doesn't have a mount for the tower. We are wintering over 7 different tower section (1 - 3ft, 1 - 10 ft, 5 - 7 ft).

NEED TO BRING AN EXTRA SOLAR PANEL MOUNT NEXT YEAR TO WAIS!!!!!!



TRS (left) and KTH (right)

McMurdo Field Work: Team 2

1/26/16: Basler to Siple Dome AWS

Purpose: Install new tower closer to the skiway and move all of the instrumentation to the new tower

MKB: Kaiser and Will

PAX: Riggers (Andrew, Mikey, and Buddy), IRIS (Phillip and David)

0856: Depart WFD

1201: Arrive SDM

We began to install the new tower about 300 feet from the refueling station at Siple Dome. The 3 riggers helped us install the new tower in about an hour. Then all 5 of us traveled by skidoo to the old site. We dug down to the batteries and brought them up to snow level. At that point it was decided that there wasn't enough ground time to remove all of the instrumentation and re-install it back on the new tower. We were able to complete the first 2 hours of work for SID.

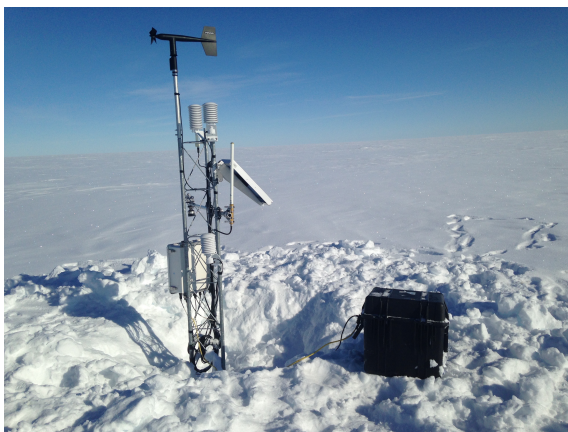
1529: Depart SDM

1819: Arrive WFD

Transport time: 5 hrs. 55 mins.

Repair time @ SID: 3 hrs. 28 mins.

SID after digging out the battery with the riggers (left)



1/27/16: Otter to Siple Dome AWS

Purpose: Remove all instrumentation off the old site and install on the new tower closer to SDM

BBV: Phil and Kelsey

PAX: none

0813: Depart WFD

1158: Arrive SDM

We grabbed a skidoo and went out to the old site. We quickly removed all of the instrumentation, except the pole for the aerovane. Lee struggled pull off the aerovane pole, but he eventually was able to get it off. Then we took the skidoo and all of the instrumentation to the new tower. We installed all of the new instrumentation without an issue. WE DID NOT PUT IN A NEW CARD!

Also, this site has an older style power system. The work took 3 hours to complete. New coordinates were taken with the UNAVCO gps unit

Wind: 247"

Upper Temp: 225"

Humidity: 168"

Boom w/ ADG and Pyranometer: 115"

Lower Temp: 80"

Bottom Enclosure: 44"

1518: Depart SDM

1842: Arrive WFD

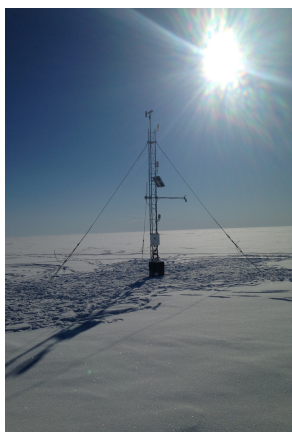
Transport time: 7 hrs. 9 mins.

Repair time @ SID: 3 hrs. 20 mins.

UNAVCO coordinates @ SID: $-81^{\circ} 39' 08.08''S$ / $-148^{\circ} 59' 30.93''W$

NOTE: The old SID aerovane was likely off by about 45° because the black box was pointing south south west.

SID at new location (left)



1/28/16: Otter to Alexander Tall Tower AWS

Purpose: Inspect the tall tower with the riggers, and raise some of the lower instrumentation

BBV: Phil and Kelsey

PAX: Riggers (Andrew, Mikey, Buddy), and JSOC (Bill, Bartley)

0832: Depart WFD

0918: Arrive BAT

The riggers were able to survey the site and they found that it had a slight tilt. They fixed the tilting and tightened the guy wires. Buddy climbed to the top and verified that the pyrometer was level. It was decided that we would wait until next year to do more of a full instrumentation raise. The junction box and one set of cables was brought above the snow surface, otherwise no other instrumentation was raised. The battery box top was at the snow level, and the power cables were only a couple of inches below the surface. This was a quick visit more for inspection than anything else. Next year will be a big year for BAT. New coordinates were taken with the UNAVCO gps unit.

1105: Depart BAT

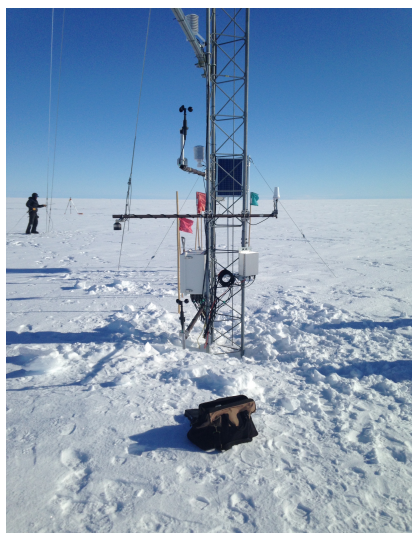
1142: Arrive WFD

Transport time: 1 hr. 23 mins.

Repair time @ BAT: 1 hr. 47 mins.

UNAVCO coordinates @ BAT: $-79^{\circ} 01' 00.34''S$ / $170^{\circ} 42' 45.63''E$

BAT lower instrumentation (left) and full AWS tower (right)



1/29/16: Helo to Laurie II AWS and Ferrell AWS

Purpose: Power cycle and check batteries at LR2, and swap the data card at FER

1217: Depart MCM

1250: Arrive LR2

Landed in ~25 kts and it was intense! We first noticed that the nose cone and prop needed to be replaced. Then Lee checked the batteries with and without the solar panel, and verified they were charged and working. We chose not to install a new power system. The system was power cycled, and transmission was verified with the Teleonics. The site will be visited again this season to fix the aerovane.

1318: Depart LR2

1338: Arrive FER

Swapped out the data card and got new coordinates with UNAVCO gps unit.

1354: Depart FER

1429: Arrive MCM

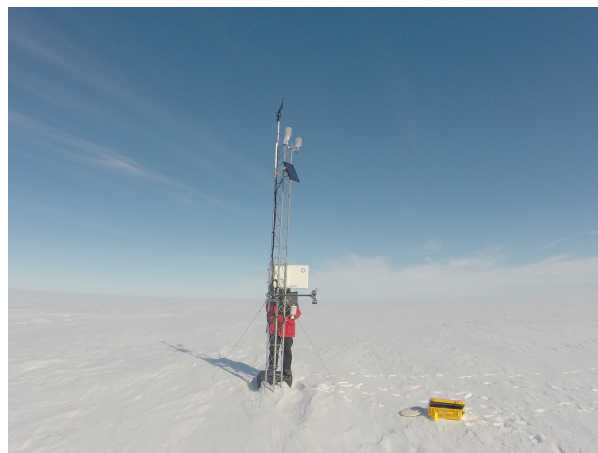
Transport time: 1 hr. 28 mins.

Repair time @ LR2: 28 mins.

Repair time @ FER: 16 mins.

NOTE: Helo pilot explained that both sites were exactly 0.4 miles from the coordinates, which were taken last year.

LR2 (left) and FER (right)



2/5/16: Otter to Nascent AWS and Vito AWS, Helo to Laurie II AWS

Purpose: Remove NSC, replace VTO (8986) with 8931 enclosure, replace LR2 nose cone and prop

KBG: Henry and Ken

PAX: Roy (NASA) and Amanda (Air Services)

0839: Depart MCM

1008: Arrive NSC

The AWS was not nearly as buried as we thought, so we figured we could recover all most everything. We got to work quickly and removed the horizontal mounts while a few people were digging. We found the first solar panel only about a foot down. Then the 3 other solar panels were another 2 to 3 feet down. We recovered all 4 solar panels, and left the mounts on the tower. Then the enclosure was the last piece we needed to get out. We ended up digging down about 6 feet to get to the top of the enclosure and then another foot to reach the bottom. Since the enclosure was wired directly, all of the cables were cut at the level of the enclosure. Finally the top 10 foot tower section was removed as well.

1145: Depart NSC

1213: Arrive VTO

The 8931 enclosure was swapped for the 8986 enclosure. We had to dig down to the power cable in order to switch the cable for one that would work for 8931. We waited for a transmission, but we only heard the beep and saw no hex data. At that point there was nothing else we could try.

1308: Depart VTO

1408: Arrive MCM

1538: Depart MCM

We tried to land at Cape Bird AWS but about half way there we saw that there was too much cloud cover. In order to not waste more helo hours, we decided to go to Laurie II.

1638: Arrive LR2

We prepared the nose cone and prop in the helo. Then Lee quickly climbed to the top of the tower, and swapped the broken nose cone with the new pieces.

1642: Depart LR2

1731: Arrive MCM

Transport time: 4 hrs. 46 mins.

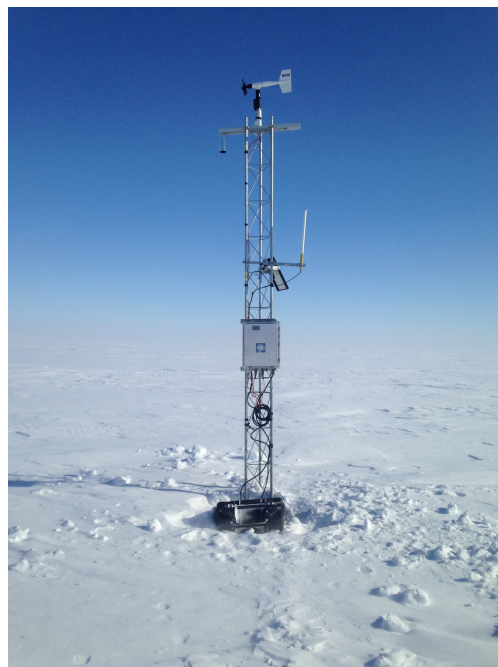
Repair time @ NSC: 1 hr. 37 mins.

Repair time @ VTO: 55 mins.

Repair time @ LR2: 5 mins.

Pilot coordinates @ NSC: -78° 01' 43.08"S / -178° 24' 57.78"W

Pilot coordinates @ VTO: -78° 24' 22.72"S / -178° 24' 17.78"W



NSC before removal (left) and VTO (right)

2/8/16: Helo to Cape Bird AWS, Minna Bluff AWS, and Marble Point AWS

Purpose: Inspect aerovane at CBD, inspect high wind speed sensor MNB, and inspect MPT

0813: Depart MCM

0835: Arrive CBD

Hiked up to the site from the helo pad. The aerovane was missing both the nose cone and the prop. Unfortunately, the white part of the aerovane was also cracked, thus the aerovane will need to be replaced with a new marine RM Young aerovane.

0917: Depart CBD

0940: Arrive MCM

1015: Depart MCM

1046: Arrive MNB

The high wind speed sensor is still spinning, but it definitely seems like something is loose inside. It could also be that there is rim stuck inside of the cylinder.

1106: Depart MNB

1154: Arrive MPT

Both sites still look great! The guy wires are the correct tightness at Marble Point II.

1215: Depart MPT

1217: Arrive Marble Point

We stopped and got some fuel

1225: Depart Marble Point

1309: Arrive MCM

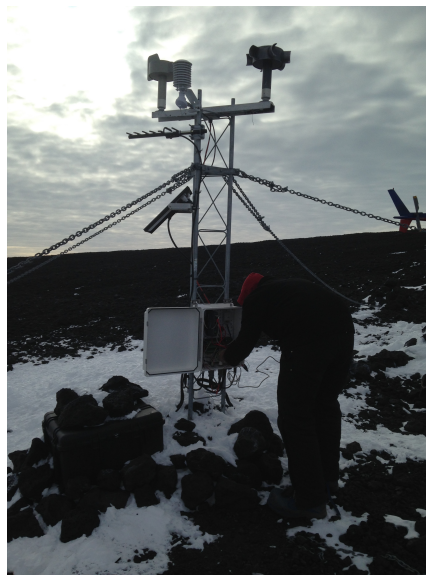
Transport time: 2 hrs. 50 mins.

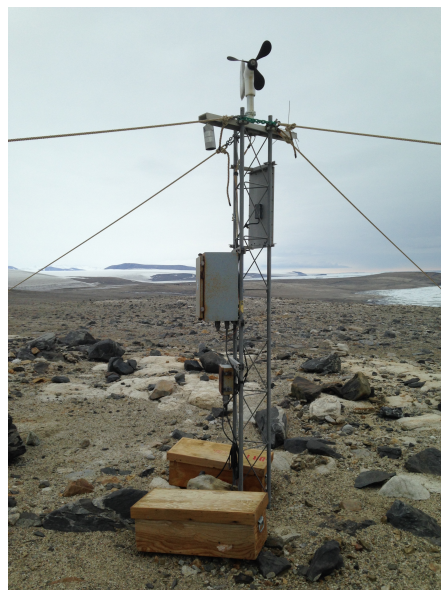
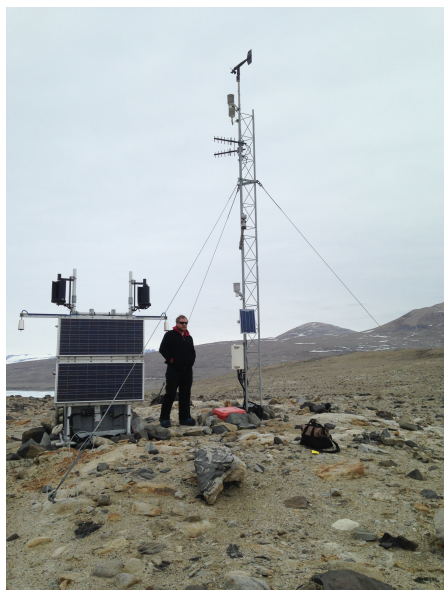
Repair time @ CBD: 42 mins.

Repair time @ MNB: 20 mins.

Repair time @ MPT: 21 mins.

CBD (left) and MNB (right)





MP2 (left) and MPT (right)

2/9/16: Helo to Lorne AWS

Purpose: Replace with a new 3-battery power system and raise the lower instrumentation

0829: Depart MCM

0905: Arrive LOR

We first dug up the 2 old style battery briefcases. Those were recovered and put into hazardous cargo in McMurdo. Then we replaced the power system with the 3 new batteries. We didn't have the correct cable for the power system, so Lee connected the old solar panel using a new cable. This wasn't the greatest fix, so a new solar panel will need to be replaced next year. Lee also looked in to problem with the pressure sensor and couldn't find a solution. Lorne will go another year with no pressure values. Then both the lower temperature and enclosure were raised a couple of feet. New coordinates were taken with the UNAVCO gps.

Wind: 180"

Upper Temp: 155"

Humidity: 154"

Boom w/ ADG and Pyranometer: 75"

Lower Temp: 65"

Bottom Enclosure: 40"

1305: Depart LOR

1341: Arrive MCM

Transport time: 1 hr. 12 mins

Repair time @ LOR: 4 hrs.

UNAVCO coordinates: -78° 11' 56.85"S / 170° 01' 33.26"E



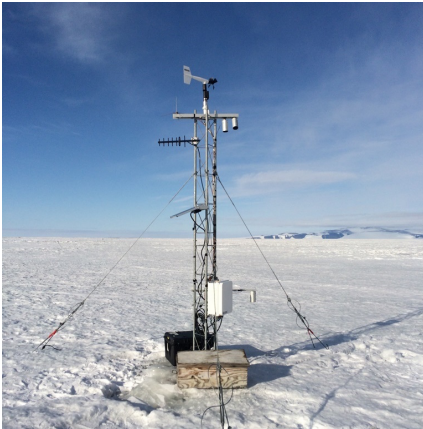
LOR before (left) and after (right)

2/26/16: Drive to Pegasus North AWS

Purpose: Fix the large tilting occurring at Pegasus North

THIS WORK WAS DONE BY ASC (1 rigger and a few others)

They were able to remove the rope and chain and install new guy wires.



PGN after (left) and the new guy securing system (right)
