

Automatic Weather Station Program 2011-2012 Field Season Report

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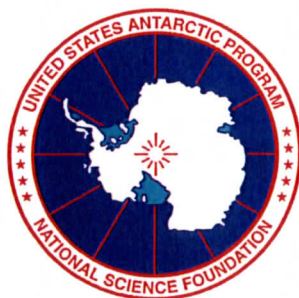
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Overview:

The National Science Foundation's Office of Polar Programs funds the University of Wisconsin's Automatic Weather Station Program to design, fabricate, deploy, and maintain an array of automatic weather stations (AWS) in remote areas in Antarctica in support of meteorological research, applications and operations. The basic AWS units measure air temperature, wind speed and direction at a nominal height of 3 meters above the surface. Air pressure is measured at the height of the AWS electronic enclosure. Some units measure relative humidity at 3 meters above the surface and the air temperature difference between 0.5 and 3 meters above the surface at the time of installation. A small, but increasing number of AWS sites measure snow accumulation and/or solar radiation. The data are collected by the ARGOS Data Collection System (DCS) on board the National Oceanic and Atmospheric Administration (NOAA) and MetOp (EUMETSAT) series of polar-orbiting satellites. This year saw an increase in the stations using Freewave modems to transmit to a receiving station in McMurdo. The AWS units are located in arrays for specific research activities and are also used for operational purposes. Any one AWS may support several experiments and all support operational meteorological services - especially support for weather forecasts for aircraft flights around the Antarctic continent. This was the 32nd field season for project O-283 (formerly S-283) under the direction of Principal Investigators (PI) from the University of Wisconsin - Madison.

Research areas supported over the years include:

- Barrier wind flow along the Antarctic Peninsula and the Transantarctic Mountains
- Katabatic wind flow down the Byrd and Beardmore Glaciers, the Siple and Adelie Coast
- Mesoscale circulation and sensible and latent heat fluxes on the Ross Ice Shelf
- The Ross Ice Shelf Air Stream.
- Climatology of long operating AWS sites, in particular Byrd and Dome C sites
- Meteorological support for the West Antarctic Ice Sheet Initiative
- Long Term Ecological Research (LTER) along the Antarctic Peninsula
- Meteorological support for United States Antarctic Program flight operations

The following are a sampling of historically supported principal investigators funded by NSF-OPP:

- Dr. Douglas R. MacAyeal: Iceberg Drift in the Near-Shelf Environment, Ross Ice Shelf, Antarctica.
- Dr. Ray Smith, Long Term Ecological Research: Racer Rock, Bonaparte Point, and Santa Claus Island.
- West Antarctic Ice Sheet Initiative: Siple Dome and West Antarctic Divide drilling sites.
- Dr. John Cassano: The Ross Ice Shelf Air Stream
- Aircraft Operation: All AWS sites in Antarctic.
- The Antarctic AWS units support many investigators outside of NSF-OPP.

AMRC collaboration:

- Climatological analysis from the AWS, and other stations (complimenting the activities in the SCAR READER project).
- Continued data collection, archival and distribution of AWS data.
- Continued educational outreach activities (as outlined in the above section and in the following outreach section).
- Utilities developed to generate climatological analyses from AWS observations.

Field work:

One of the unique aspects of maintaining the AWS observational network is the necessary fieldwork. A full time job in and of itself, keeping a network of 50 to 70 AWS systems operating, even with international partners, requires a devoted effort of AWS fabrication and repair team members doubling as field personnel. Flying to remote places around the Antarctic and dealing with polar weather conditions makes maintenance a challenge. The success of the AWS network would not be possible without the support of all those who help, directly or indirectly. Thanks go to Ken Borek Air, the 109th New York Air National Guard, PHI Helicopters, Raytheon Polar Services, our international partners in France, Australia, United Kingdom, Japan, New Zealand and China, and especially the Office of Polar Programs at the National Science Foundation in the USA.

For the 2011-2012 field season, the field team consisted of Jonathan Thom (O-283), and Lee Welhouse (O-283) from the University of Wisconsin-Madison Space Science Engineering Center, and John Cassano (O-283), and Alice DuVivier (O-283) from the University of Colorado- Boulder. Jonathan Thom and Lee Welhouse deployed to McMurdo on November 4th, 2011 for the early portion of the season which consisted of updating a number of stations in the Ross Island region to Freewave transmitters, some AWS service work in the Ross Ice Shelf as well as the consolidation of the stations in Cape Hallett. Jonathan Thom departed McMurdo on December 7th, 2011 for return to Madison. Lee Welhouse completed the middle portion of the season, which consisted of work out of Siple Dome station, WAIS-D camp, Byrd camp, and South Pole Station though weather issues would require a return to Byrd camp later in the season. John Cassano and Alice DuVivier arrived in McMurdo on January 2nd, 2012 to complete the final portion of the season. The final portion of the season consisted of work out of Byrd Camp done by Lee Welhouse and Alice DuVivier, and work on the Ross Ice Shelf and the Ross Island region completed by John Cassano and Alice DuVivier.

Summary of 2011/2012 field season for O-283:

Sabrina faulty pressure sensor replaced, program updated, and compact flash card replaced
11/15/2011

Tom power system replaced, compact flash card replaced 11/15/2011

Elaine instrumentation was raised 11/15/2011

Windless Bight instrumentation was raised 11/17/2011

Cape Hallett LTER station consolidated with New Zealand AWS at AWS location 11/20/2011

E-66 French Station fully removed 11/27/2011

Minna Bluff removal of old enclosure and antenna 11/28/2011

Minna Bluff installation of new enclosure and antenna 11/30/2011

Marble Point II installation of new freewave station 12/1/2011

Cape Bird removed old enclosure and instrumentation and installed new freewave station 12/2/2011

Lorne removed old enclosure and instrumentation and installed new freewave station 12/3/2011

Siple Dome removed old argos station and installed new argos station 12/8/2011

Kominko-Slade removed old station, installed new station and consolidated snow temperature probe. 12/17/2011

South Pole Test Station removed all instrumentation, enclosures and batteries 12/29/2011

Lorne removed yagi antenna and enclosure, installed argos antenna, enclosure was installed later by Lars Kalnajs of O-324 01/14/2012

Harry raised instruments 01/19/2012

Mary full removal of the enclosure, instruments, and one 7 foot tower section. 01/20/2012

Erin raised instruments 01/21/2012

Siple Dome adjusted wind speed direction 01/21/2012

Alexander Tall Tower inspected tower and retrieved data 01/26/2012

Schwerdtfeger Installed new batteries 01/31/2012

Carolyn replaced AWS and raised instruments 02/04/2012

Lettau 02/04/2012

Manuela replaced AWS station with new enclosure and instruments 02/07/2012

Amsler Island AWS placed by Jim Bockheim

Cierva Cove AWS placed by Jim Bockheim

| | | | | | | | |
|---------------|------------------|-------------------|----------|-----------|-------------|-------|--|
| 8695 | Vito | AWS2S | 78.509oS | 177.746oE | @+52 | | TX OK |
| 8697 | Eric | AWS2S | 81.504oS | 163.940oE | @+4 5 | | TX OK |
| 8983 | Carolyn | AWS2S | 79.964oS | 175.842oE | @+52 | | AWS installed Feb 2012 |
| 8900 | Harry | AWS2B | 83.003oS | 121.393oW | 945 | | AWS serviced Jan 2012 |
| Freewave | Cape Bird | AWSCR1000 | 77.224oS | 166.440oE | @42 | | TX OK |
| 8901 | Cape Bird | AWS2B | 77.224oS | 166.440oE | @42 | | Replaced day 335 2011 |
| 8902 | Butler Island | AWSCR1000 | 72.207oS | 60.160oW | 91 | 89266 | TX OK |
| 8903 | Byrd | AWSCR1000 | 80.007oS | 119.404oW | 1530 | 89324 | TX OK |
| 8904 | Dome Fuji | AWSCR1000 | 77.31oS | 39.70oE | 3810 | 89734 | TX OK |
| 8905 | Manuela | AWS2B | 74.946oS | 163.687oE | 80 | 89864 | OFF, Wind out - Belfort |
| 8905 | Manuela | AWSCR1000 | 74.946oS | 163.687oE | 80 | 89864 | New AWS test data Jan 13 |
| 8906 | Marble Point | AWS2B | 77.439oS | 163.754oE | @108 | 89866 | TX OK |
| Freewave | Marble Point | AWSCR1000 | 77.439oS | 163.754oE | @108 | 89866 | TX OK |
| New 2011 8907 | New AWS 2011 | AWS test ID | | | | | Madison WI |
| 8908 | Marlene | AWSCR1000 | 83.65oS | 167.40E | TBD | | TX OK |
| 8909 | Port Martin | AWS2HWS | 66.82oS | 141.40oE | 39 | | OFF |
| 8909 | Cape Denison | AWSCR1000H- WS | 67.009oS | 142.664oE | 31 | | OFF Day 161, 2011 |
| 8910 | Roosevelt Island | AWSCR1000 | 80.00°S | 165.00°W | @67 | | TX OK/Turn off NL115 |
| 8911 | Gill | AWSCR1000 | 79.985oS | 178.611oW | @54 | 89376 | TX OK |
| 8912 | D85 | AWS2B | 68.912oS | 134.655oE | | | TX OK |
| 8913 | Schwerdtfeger | AWS2B | 79.875oS | 170.105oE | @54 | 89868 | TX OK/Low batteries Removed 331 2011(site inactive) |
| 8914 | E-66 | AWS2B | 68.912oS | 134.655oE | | | |
| New 8915 | Sabrina | AWSCR1000 | 84.25 S | 169.98 W | @88 | | TX OK visited 2011/12 |
| 8916 | D-47 | AWSCR1000 | 70.426oS | 134.146oE | | | TX OK |
| 8917 | Ski-Hi | AWSCR1000 | 74.792oS | 70.488oW | 1395 | 89272 | TX Infrequent check |
| 8918 | Relay Station | AWSCR1000 | 74.017oS | 43.062oE | 3353 | 89744 | TX OK |
| 8919 | Tom | AWSCR1000 | 84.43 S | 171.46 W | TBD | | On visited 2011/112 |
| 8920 | Fossil Bluff | AWSCR1000 | 71.33oS | 68.283oW | 63 | 89065 | TX OK |
| 8921 | Bonaparte Point | AWSCR10X | 64.778oS | 64.067oW | 8 | 89269 | TX Data to be checked |
| 8922 | Bear Peninsula | AWSCR1000 | TBD | TBD | TBD | | TX OK |
| 8923 | Evans Knoll | AWSCR1000 | TBD | TBD | TBD | | TX OK |
| 8924 | Nico | AWS2B | 89.000oS | 89.669oE | 2935 | 89799 | TX OK |
| 8925 | Limbirt | AWSCR1000 | 75.422oS | 59.851oW | 40 | 89257 | TX OK |
| 8926 | Larsen Ice | AWSCR1000 | 66.949oS | 60.897oW | 17 | 89262 | TX OK |
| New 2011 8927 | AGO 4 | AWSCR1000 | 82.017 S | 96.767 E | 3565 | | TX OK |
| 8928 | Lettau | AWSCR1000 | 82.518oS | 174.452oW | 55 | 89377 | OFF Day 208 |
| 8929 | Ferrell | AWS2B | 77.865oS | 170.819oE | @45 | 89872 | TX OK |
| 8930 | Thurston Island | AWSCR1000 | TBD | TBD | TBD | | TX OK |
| 8931 | Brianna | AWS2B | 83.889oS | 134.154oW | @525 | | TX OK, Low Battery |
| 8932 | Dismal Island | AWSCR10X | 68.087oS | 68.825oW | 10 | | TX OK |
| New 8933 | New AWS - HWS | AWSCR1000H- WS | | | | | Hobart found to be returned |
| 8934 | Marilyn | AWS2B | 79.954oS | 165.130oE | (72)@ 64 | 89869 | TX OK |
| 8935 | Santa Claus I | AWSCR1000 | 64.964oS | 65.670oW | 25 | | TX, Data issues |
| 8936 | Janet | AWSCR1000 | 77.17 S | 123.39 W | | | TX OK |
| 8937 | Pegasus North | AWSCR1000 | 77.990oS | 166.568oE | @5 | | TX OK |
| 8938 | Siple Dome | AWS2C | 81.656oS | 148.773oW | @668 | 89345 | Replaced day 335 2011 |
| New 2011 8939 | McMurdo | AWSCR1000 | | | | | |
| 8947 | Ferrell II | AWSCR1000 | 77.865oS | 170.819oE | @45 | 89872 | TX OK |
| 8980 | Emilia | AWSCR10X | 78.509oS | 173.114oE | @+50 | | TX OK |
| 8981 | Mount Siple | AWS2DH | 73.198oS | 127.052oW | 230 | 89327 | OFF Day 214/Low Batteries |
| 8982 | Windless Bight | AWSCR10X | 77.728oS | 167.703oE | 61 | | TX OK |
| 8983 | Mary | AWSCR10X | 79.303oS | 162.968oE | @+5 8 | | Removed Jan 2012 |
| 8984 | Possession Is. | AWSDH | 71.891oS | 171.210oE | 30 | 89879 | TX OK/Low Batteries |
| 8985 | Henry | AWS2B | 89.011oS | 1.025oW | 2755 | 89108 | TX OK/Low Batteries |

Sabrina

Visited on 11/15/2011

Pilots: Ted and Braden (KBA)

Field Team: Jonathan Thom and Lee Welhouse

Location 84.25°S, 170.07°W

Instrumentation:

Upper and lower temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

Acoustic Depth Gauge (ADG): CSI Canada SR50A

Pressure: Vaisala Pressure Sensor

Radiation Sensor: LI200X

Heights:

ADG: 89"

Humidity: 104"

Enclosure: 104"

Lower temperature: 30.5"

Upper temperature: 169"

Wind: 175"

Sabrina pressure readings had failed soon after installation. The Paroscientific pressure sensor was replaced with a Vaisala PTB110 pressure sensor. The compact flash card was replaced and a new program was uploaded to the station for the new pressure sensor. Some loose cables were tied down. All data was nominal when we departed and Argos transmissions were received.



Sabrina after visit

Tom

11/15/2011

Pilots: Ted and Braden (KBA)

Field Team: Jonathan Thom and Lee Welhouse

Location: 84.43°S, 171.48°W

Instrumentation:

Upper and lower temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Paroscientific Pressure Gauge

Radiation Sensor: LI200X

Heights:

ADG: 136"

Humidity: 112"

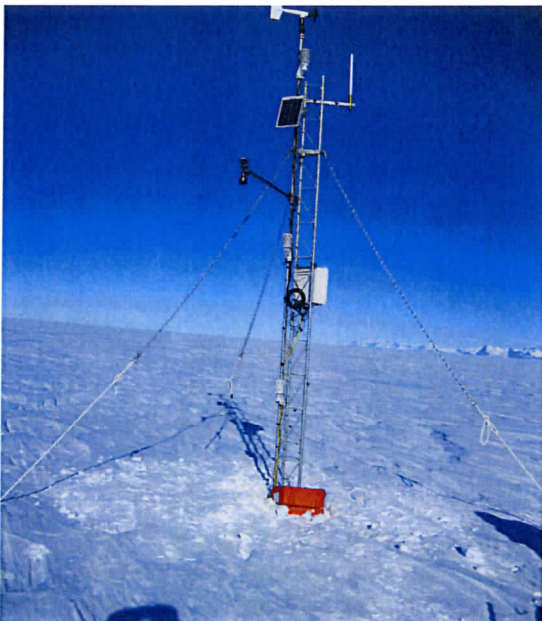
Enclosure: 89"

Lower temperature: 45"

Upper temperature: 193"

Wind: 208"

Tom experienced a total power system failure during the winter. The station resumed transmitting as the sun came up, but only when solar panel was in full sun. The power system was replaced with new batteries, charge controller and solar panel. The compact flash card was replaced and the station restarted. All data was nominal when we departed and Argos transmissions were received.



Tom after visit

Elaine

11/15/2011

Pilots: Ted and Braden (KBA)

Field Team: Jonathan Thom and Lee Welhouse

Location: 83.094°S, 174.285°E

Instrumentation:

Upper Temperature: R.M. Young RTD Probe

Snow Temperature: Weed Platinum Resistance Thermometer (PRT)

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Vaisala Pressure Sensor

Radiation Sensor: LI200X

Heights:

ADG: 25"

Humidity: 36"

Enclosure: 44"

Lower temperature: snow temperature

Upper temperature: 94"

Wind: 118"

Elaine was working, but some instrumentation needed to be raised and changed location. The ADG boom was raised and the pyranometer was moved to the ADG boom. The CR1000 firmware was updated to the current version and a new program was uploaded. The compact flash card was recovered. However, the compact flash card was not readable and the data could not be recovered.

The new ADG height is 90" and the new pyranometer height is 105"

The station will need to be raised in one to two years. When the station is raised a new 14-plate radiation shield for the HMP155 should be used to replace the current radiation shield. Bring the small U-bolts for the CSI cross-arm mount plates as the incorrect U-bolts were used to mount the plates to the tower.



Elaine before raise



Elaine after raise

Windless Bight

11/17/2011

Snowmobile trip to Windless Bight

Field Team: Jonathan Thom and Lee Welhouse

Location 77.726°S, 167.684°E

Instrumentation:

Upper and lower temperature: R.M. Young Resistance Temperature Device (RTD) probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Vaisala Pressure Sensor

Radiation Sensor: LI200X

Heights:

ADG: below snow surface

Boom: 46"

Box: bottom of the box in the snow

The station needed to be raised as the bottom of the box was in the snow and the ADG boom was buried about two feet beneath the snow. The station was raised one 7-foot tower section. Argos transmission was received after the station was powered back up.

Final Heights:

ADG: 86"

Box: 73"

Boom: 144"

Antenna: 137"



Windless Bight Before



Windless Bight After

Cape Hallett

11/20/2011

Field Team: Jonathan Thom and Lee Welhouse

Locations:

Removed LTER AWS: S 72 19.183' E 170 13.623'

Current AWS: S 72 19.199' E 170 13.597'

Camp Site: S 72 19.440' E 170 12.502'

Instrumentation:

Upper temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 45

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Paroscientific Pressure Sensor

Radiation Sensor: CNR2 and Photosynthetically active radiation sensor (PAR)

Soil Moisture probes

Two-night trip to Cape Hallett with Cindy Dean and John Rand. Moved LTER station to the location of the New Zealand AWS to incorporate the soil moisture and temperature sensors. The heights of the LTER station will be the same as when the station was originally installed.

The stakes holding the LTER station were not recoverable from the permafrost. The three stakes were buried below the surface.

Final Heights:

ADG: 65"

Box: 49"

RTD: 76"

Wind: 119"

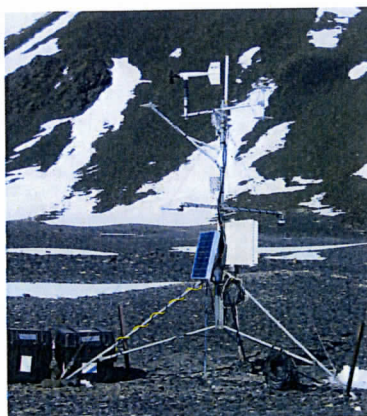
HMP: 105"

PAR: 112"

Net Radiometer: 71"

Solar in: 120"

Solar out: 108"



Cape Hallett before consolidation Cape Hallett after consolidation

Minna Bluff

11/25/2011 and 11/26/2011

Field Team: Jonathan Thom and Lee Welhouse

Location: 78.555°S, 166.691°E

Minna Bluff was visited twice over two days. The first trip involved removing the old antenna and AWS enclosure. On arrival at the site, the existing Freewave Yagi antenna was hanging loosely on the tower. Although the antenna was loose, connections were made periodically to the station. The second trip we installed the new Minna Bluff enclosure and a new Freewave Yagi Antenna. The new enclosure will allow data and power connections with the ozone instrumentation. The new Yagi has a much more robust antenna mount and should not loosen as the other one did. The polarization of the antenna is still horizontal.

Instrumentation:

Temperature: Weed PRT

Humidity: Vaisala HMP 45

Wind speed and Direction: Taylor High Wind Speed System

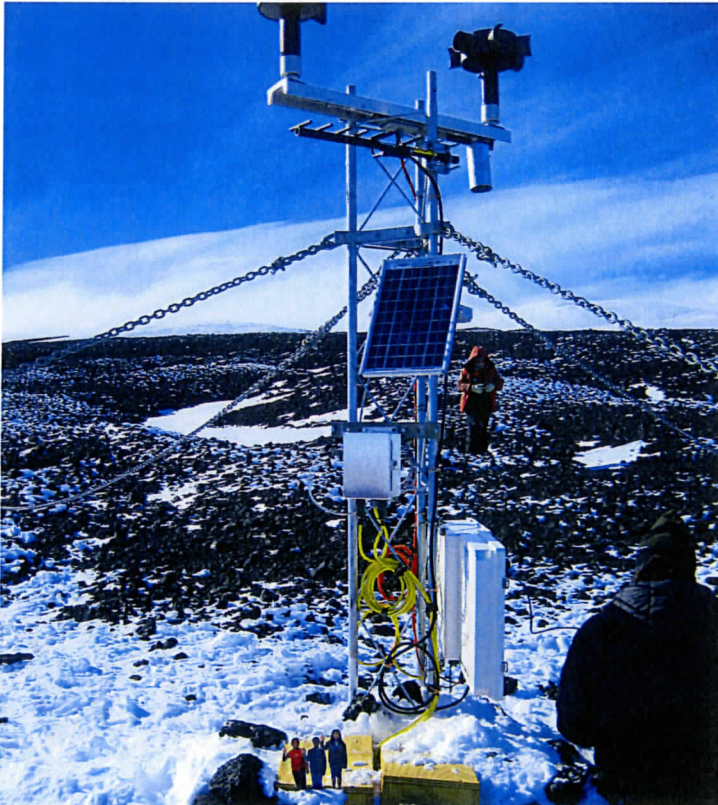
ADG: None installed

Pressure: Vaisala Pressure Sensor

Radiation Sensor: None installed

Heights:

Boom: 87"



Minna Bluff after visit

Marble Point II

12/01/2011

Field Team: Jonathan Thom and Lee Welhouse

Riggers: Jay Cairns, Alec Chin

Location: 77.439°S, 163.759°E

We installed a second AWS at Marble Point east of the existing AWS. Jay Cairns and Alex Chin from the rigger shop helped with the installation of the new tower. The new AWS relays data via Freewave. The Marble Point AWS is a repeater site for Cape Bird AWS. The new installation went well and everything was operating nominally.

Instrumentation:

Upper and lower temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Paroscientific Pressure Sensor

Radiation Sensor: LI200X

Heights:

ADG: 116"

Pyranometer: 124"

Box: 34"

Lower temperature: 85"

HMP: 213"

Upper temperature: 213"

Wind: 231"



Marble Point II after installation

Cape Bird

12/05/2011

Field Team: Jonathan Thom and Lee Welhouse

Location: 77.217°S, 166.439°E

Existing Heights:

Boom: 110"

Box: 43"

Replaced the AWS at Cape Bird with a new Freewave based AWS. The tower section was replaced with a stainless steel tripod. The power system was reused. The power system for the AWS should probably be replaced next year. There was a lot of corrosion on the connectors and the solar panel has lost most of its back coating.

Instrumentation:

Temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Paroscientific Pressure Sensor

Radiation Sensor: None installed

Heights:

Box: 20"

Pressure: 39"

HMP: 70"

ADG: 113"

Wind: 127"

Temperature: 135"



Cape Bird Before



Cape Bird After

Lorne

12/03/2011 and 01/14/2012

Field Team: Jonathan Thom and Lee Welhouse

Location: 78.222°S, 170.0145°E

Existing Heights:

Box: 47"

Boom: 122"

Replaced the AWS at Lorne with a Freewave based AWS. We were unable to make a Freewave connection to McMurdo while we were in the field. This may be due to the distance and low angle of the Lorne Yagi. The Freewave modem was replaced later in the season. If possible we may try and install a repeater site on White Island in the future, which would involve reinstalling a Freewave modem at this station.

Instrumentation:

Upper and lower temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Paroscientific Pressure Sensor

Radiation Sensor: LI200X

Heights:

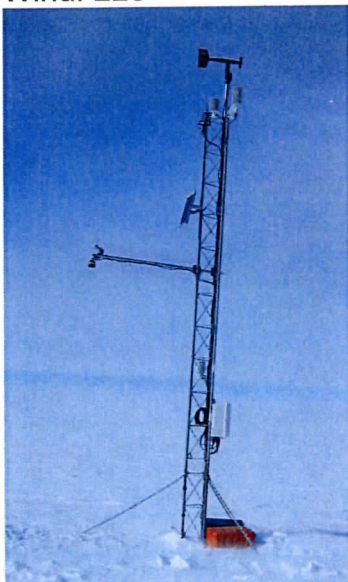
Box: 51"

Lower temperature: 81"

Pyranometer/ADG boom: 130"

Upper temperature: 206"

Wind: 228"



Lorne after freewave install

Willie Field

12/04/2011

Field Team: Lee Welhouse, Jonathan Thom

Update the AWS enclosure with a freewave radio and antenna. The station is now connected into the Freewave network. The CR1000 at Willie Field displayed some hardware issues. The serial number is not visible through "Device Configuration" and there are issues with the CF card writer. The CR1000 module should be replaced in the future and the existing CR1000 returned to Campbell Scientific for evaluation. There were gaps in the data written to the CF card.

Instrumentation:

Upper and lower temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 45

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Vaisala Pressure Sensor

Radiation Sensor: None installed

Heights

Lower temperature: 29"

Box: 61"

Upper temperature: 130"

HMP: 130"

Wind: 149"



Willie Field after Freewave conversion

Siple Dome

12/08/2011 and 01/21/2012

Field Team: Lee Welhouse

Location: 81.656°S,148.772°W

Existing boom: 18"

Upon arrival station was mostly buried. The old enclosure and boom were removed, a new tower section was added to increase the height and a new station was installed. This station may be moved closer to the Siple Dome refueling station. The later visit was to adjust the direction of the aerovane as it was improperly oriented.

Instrumentation:

Upper and lower temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Paroscientific Pressure Sensor

Radiation Sensor: LI200X

Lower Temperature: 79"

Enclosure: 63"

Acoustic Depth Gauge: 72"

Pyranometer: 82"

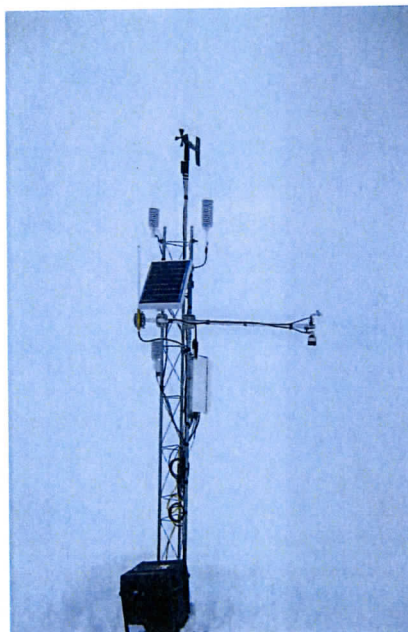
High temperature: 123"

Humidity sensor: 123"

Aerovane: 136"



Siple Dome before



Siple Dome after

Kominko-Slade

02/17/2011

Field Team: Lee Welhouse

Assisted by: August Allen

Location: 79.466°S, 112.1062°W

The old station was removed, except for the snow temperature string which is connected through a secondary enclosure to the new station. The new station was successfully installed with assistance.

Old Heights:

Lower boom: at surface

Lower enclosure (snow string): 16"

Middle temperature boom: 40"

Primary enclosure (AWS): 60"

AWS Boom: 125"

Instrumentation:

Temperature: R.M. Young RTD probe, Weed PRT and snow profiles

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Paroscientific Pressure Sensor

Radiation Sensor: CNR2

New Heights:

Lower boom: 64"

Secondary enclosure: 63"

Primary enclosure: 40"

Acoustic Depth Gauge: 112"

Lower Temperature: 121"

Humidity: 232"

High Temperature: 232"

Wind: 248"



Kominko-Slade before reinstall



Kominko-Slade after reinstall

South Pole

12/30/11

Field Team: Lee Welhouse

The test station was successfully removed and returned to McMurdo. All batteries, tower sections, and instrumentation were recovered.



Test station before removal

AGO 4

12/30/11

Field team: Michelle Brown

Location: 82.01°S, 96.76°E

Most of my time at the AGO was spent installing an Automated Weather Station (AWS). The AWS will record information about the weather at AGO 4, providing important data for scientists and the public (including my classes) to study. I installed the towers, enclosure, and instrumentation.

Instrumentation:

Temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 155

Wind speed and Direction: RM Young Wind Monitor

ADG: Not installed

Pressure: Paroscientific Pressure Sensor

Radiation Sensor: LI200X

Heights:

Temperature: 92"

Humidity: 82"

Wind speed: 116"

Enclosure: 42"

Radiation Boom: 70"



Ago4 station mid install

Harry

01/19/2012

Field Team: Lee Welhouse and Alice DuVivier

Location: 83.005°S, 121.4033°W

This day we attempted to visit Harry, Brianna, and Erin. The region around Brianna was found to be heavily crevassed, so no visit was viable. Harry was the only station available, upon visiting the station was raised by a single tower section.

Instrumentation:

Temperature: Weed PRT

Wind Speed: Belfort/Bendix Aerovane

Humidity: Vaisala HMP 45

Pressure: Paroscientific Pressure Sensor

Heights before raise:

Enclosure: 10"

Solar panel: 45"

Boom: 59"

Heights after raise:

Boom: 143"

Enclosure: 66"

Jct. Box: 31"

Solar Panel: 108"



Harry before raise



Harry after raise

Mary

01/12/2012 Field

Field team: John Cassano

Helo crew: Flo and John (heli-tech)

Morale: Lisa and Dan

Location: 79.310°S, 163.037°E

Remove Mary AWS. Removed boom, solar panel, AWS enclosure, junction box, lower boom / ADG, and one 7' tower section. All other tower sections, anchors, and battery boxes were left at the site.

Instruments:

Temperature: Weed PRT

Wind speed and direction: RM Young Wind Monitor

Humidity: Vaisala HMP 45

Pressure: Paroscientific Pressure Sensor

Instrument heights:

Upon arrival the AWS enclosure, junction box, and lower boom/ADG were all buried.

Boom: 65"



Mary before removal

Erin:

1/21/2012

Field team: Lee Welhouse

Location: 84.90269°S, 128.8528°W

The station was found to be partially buried, with the junction box, solar panel, and main instrument boom being above surface. The instruments were raised by two 7' tower sections, and the station transmitted successfully. Issues with temperature, wind speed, and delta-T were discovered later.

Instruments:

Temperatures: Weed PRT

Wind speed and direction: RM Young Wind Monitor

Humidity: Vaisala HMP 45

Pressure: Paroscientific Pressure Sensor

Initial heights:

Junction box: surface

solar panel: 16"

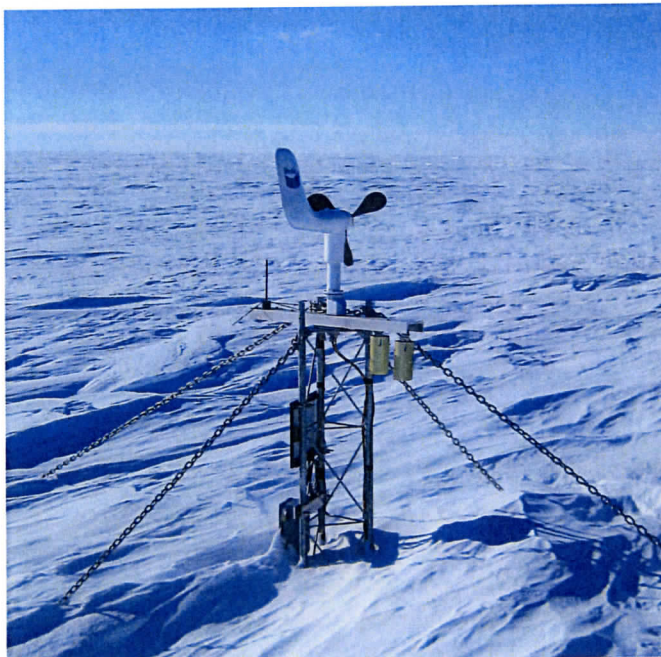
Boom: 37"

Heights after raise:

Boom: 212"

Enclosure: 112"

lower temp: 99"



Erin before raise



Erin after raise

Alexander Tall Tower

01/26/2012

Field Team: John Cassano, Alice DuVivier

Riggers: Jay Cairns, Alec Chin

Location: 79.0387°S, 170.661°E

Removed 1GB memory card and installed a new memory card. The tower was inspected by the riggers and it appeared to be in good condition. The guy wires were retensioned and the tower was vertical.

Heights:

Level 1 anemometer: 35"

Level 1 temperature: 24"

Level 2 anemometer: 73"

Level 2 temperature: 61"

AWS enclosure: 80"



Tall tower

Schwerdtfeger

01/31/2012

Field team: John Cassano, Alice DuVivier

Twin Otter crew: Mark and Derek

Morale: Trish and Mimi

Location: 79.837°S, 170.271°E

The station was found to be in good condition. Two new battery boxes were installed, the height of the station didn't require raising.

Instruments:

Temperature: Weed PRT

Wind speed and direction: Belfort/Bendix Aerovane

Humidity: Vaisala HMP 45

Pressure: Paroscientific pressure sensor

Instrument heights:

Jct. box: 35"

AWS enclosure: 48"

Solar panel: 74"

Boom: 152"



Schwerdtfeger after visit

Carolyn

02/04/2012

Field team: John Cassano, Alice DuVivier

Twin Otter crew: Mark and Derek

Morale: Carey and Kathryn

Location: 79.920°S, 175.917°E

The batteries were checked, and reported 12.6 V from each battery box, with 12.6 V recorded at the AWS enclosure. We disconnected and reconnected the power and checked for data transmission with no successful transmission recorded. The AWS was replaced with AWS 8983 (removed from Mary on 20 Jan 2012). A 7' tower section was added and the junction box, AWS, solar panel, and boom were all raised. We removed lower delta T boom, ADG, and ADG Campbell logger. All instruments appeared to be in good condition.

Instruments:

Temperature: Weed PRT

Wind speed and direction: RM Young Wind Monitor

Humidity: Vaisala HMP 45

ADG: CSI SR50A

Pressure: Paroscientific Pressure Sensor

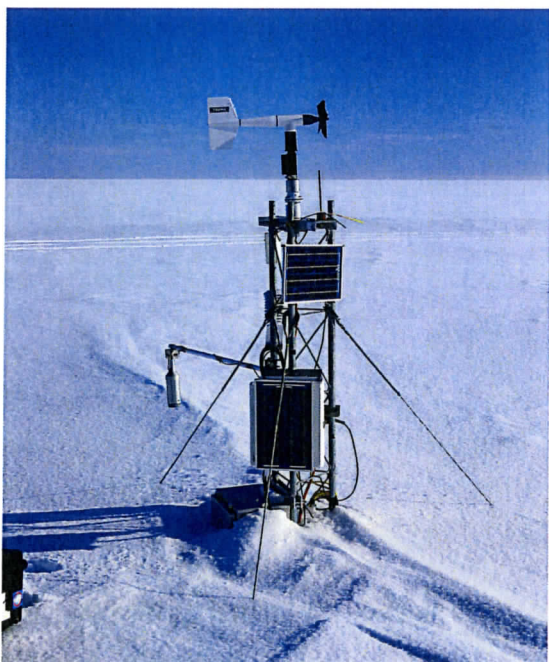
Instrument heights after being raised (all heights to bottom of instrument):

Jct. box: 44"

Solar panel: 54"

AWS enclosure: 71"

Boom: 146"



Carolyn before raise



Carolyn after raise

Lettau

02/04/2012

Field team: John Cassano, Alice DuVivier

Twin Otter crew: Mark and Derek

Morale: Carey and Kathryn

Location 82.472°S, 174.596°W

The power system was reporting 6.4V from each battery box, with the solar panel reporting 14V and 14V at the plug going to the CR1000. The CR1000 electronics gave no signal when a connection was attempted, so the enclosure was removed for return to Madison. All instruments appeared to be in good condition and the station did not need to be raised. It appears that there is a problem with the batteries (and possibly junction box?) and these should be replaced during the next site visit.

Instrumentation:

Upper and lower temperature: R.M. Young RTD probe

Humidity: Vaisala HMP 45

Wind speed and Direction: RM Young Wind Monitor

ADG: CSI Canada SR50A

Pressure: Vaisala Pressure Sensor

Radiation Sensor: LI200X

Instrument heights (all heights to bottom of instrument):

Lower T: 37"

Jct. box: 76"

AWS enclosure: 88"

HMP: 108"

ADG / Pyranometer: 134"

Solar panel: 174"

Upper T: 193"



Lettau before enclosure removal

Manuela

02/07/2012

Field team: John Cassano, Alice DuVivier

Rigger: Dan Mahon

Helo pilot: Christopher Dean

Location: 74.945°S, 163.692°E

Instrumentation:

Temperature: Weed PRT

Humidity: Vaisala HMP 45

Wind speed and Direction: Taylor High Wind Speed System

ADG: None installed

Pressure: Vaisala Pressure Sensor

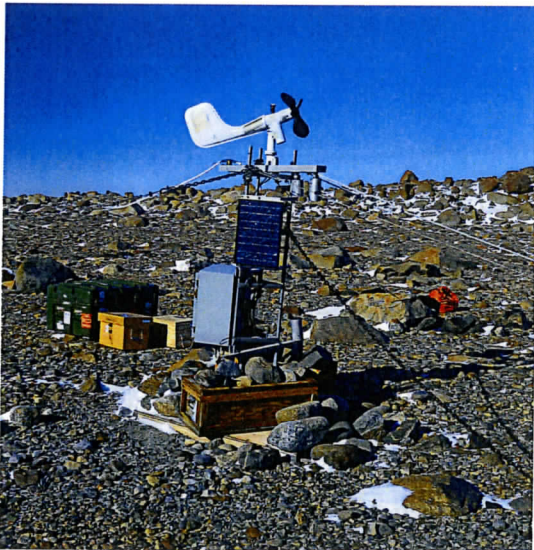
Radiation Sensor: None installed

We removed old AWS, batteries, and tower, installed a new 7' tower and re-anchored it to the rock surface. A CR1000 (ID 8905) AWS, 5-prong antenna, high wind system, and boom with T and RH were installed.

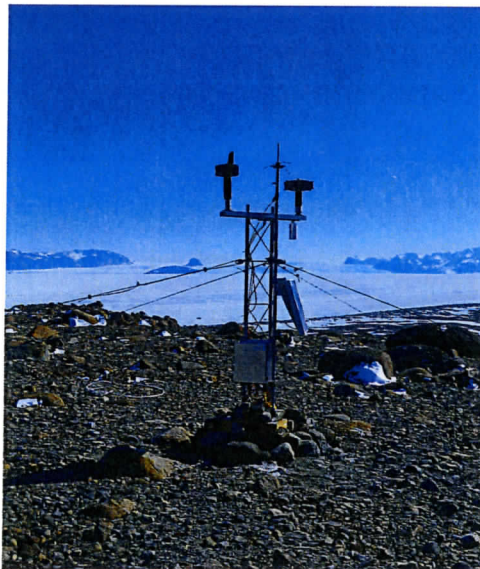
Note: The boom was oriented with the wind speed sensor pointing towards 350 degrees.

Instrument heights were not measured.

The boom was at the top of the 7 foot tower.



Manuela prior to removal



Manuela after new install

Amsler Island and Cierva Cove

Two AWS units installed by Jim Bockheim's group this year. These stations are located at 64°46'S, 64°04'W, and 64°09'S, 60°57'W respectively. They are measuring air temperature, relative humidity, rainfall, solar radiation, wind speed and direction, and soil moisture, temperature and electrical conductivity at four depths.

Summary of AWS 2012-2013 Field Season Meeting:

Station visits planned:

Elaine will need to be raised and new radiation shield for the HMP 155 RH sensor

Windless Bight will need to be raised and potentially replaced with a freewave AWS

White Island will be a new AWS install, if approved, with Freewave/relay

Lorne will be replaced with a freewave station if a White Island relay station is installed

Willie Field the CR1000 was having issues and will need repair.

Pegasus North the CR1000 was having issues and will need repair.

Lettau the electronics were removed to Wisconsin for repair, so they will need to be reinstalled

Port Martin will be a new AWS installation.

Cape Denison will be a new AWS installation.

Elizabeth will be in need of a raise.

Vito will require a raise.

Emilia will require a raise.

Margaret will require a raise, replacing the data card, and basic servicing.

Ferrell I/II one of these stations will be removed.

Nascent potentially needs a visit for a raise.

Erin is having issues with some of the data so will require a visit for repair.

Brianna crevasses were found in the vicinity during the 2011-2012 season, depending on conditions removal if satellite imagery shows the area is more open.