

WISCONSIN AUTOMATIC WEATHER STATION FIELD SEASON 2017-2018

**DAVID MIKOLAJCZYK¹, CAROL COSTANZA¹, MARIAN MATELING², MATTHEW LAZZARA^{1,3},
ANDY KURTH⁴, & GEORGE HADEMENOS⁵**

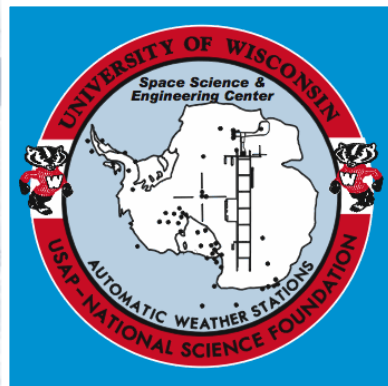
¹*Antarctic Meteorological Research Center, Space Science and Engineering Center, University of Wisconsin-Madison*

²*Dept. of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison*

³*Dept. of Physical Sciences, School of Arts and Sciences, Madison Area Technical College*

⁴*Dept. of Electronics and Electrical Engineering, School of Arts and Sciences, Madison Area Technical College*

⁵*Richardson High School, Richardson, TX*



OUTLINE

- The field teams
- PolarTREC with George Hademenos
- Planned Automatic Weather Stations (AWS) to visit
- Part I: Late October to early December 2017
 - Carol and George in McMurdo
- Part II: Early December 2017 to early February 2018
 - Dave and Marian at WAIS
- Part III: Early January to mid-February 2018
 - Matt and Andy in McMurdo
- Other AWS visits
 - IPEV – D-10
 - AWS1 and AWS2 – Princess Elisabeth Station (separately funded)

THE TEAMS

1



Carol Costanza



George Hademenos

2



Dave Mikolajczyk



Marian Mateling

3



Matthew Lazzara



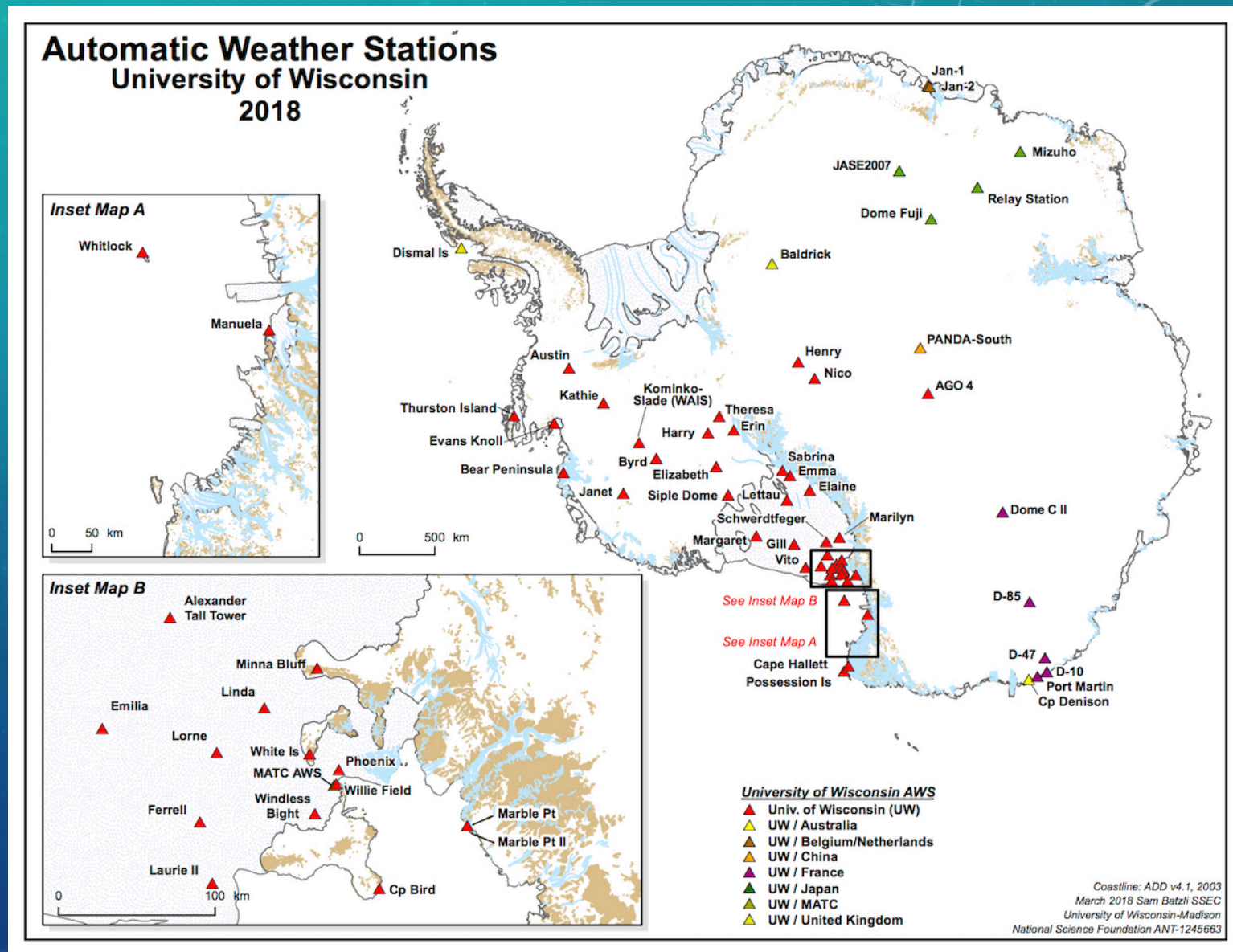
Andy Kurth

POLARTREC WITH GEORGE HADEMENOS

- The Expedition:
 - Deployed with Carol in McMurdo
 - Visited Lorne, Marble Pt I and II, Cape Bird, White Island, Minna Bluff, Phoenix
- Items completed after the field season:
 - Published article in STATellite (magazine of the Science Teachers Association of Texas)
 - Presented experience at MiniCAST: Science conference for area science teachers
 - Co-authored paper with PolarTREC teachers
- In the works:
 - Book for general audience about experience
 - Children's book
 - Weather Station project: comparing real-time weather in TX to Antarctica

FIELD SEASON PLANS

- Plan to service 25 AWS
 - 14 from McMurdo
 - 8 from WAIS
 - D-10
 - AWS1 and AWS2



PART I:

Lorne

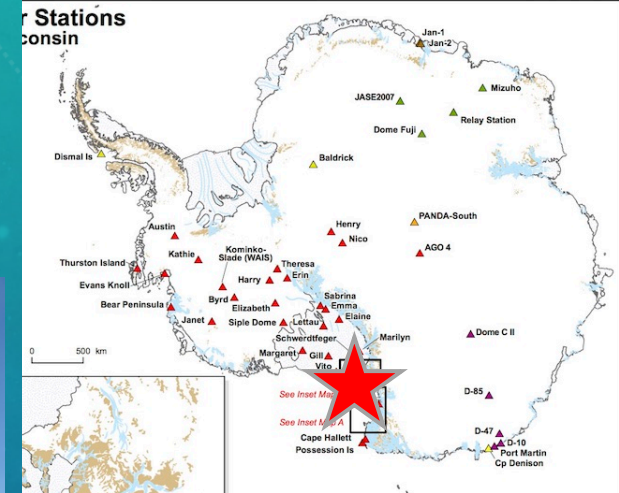
- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!



Before



After



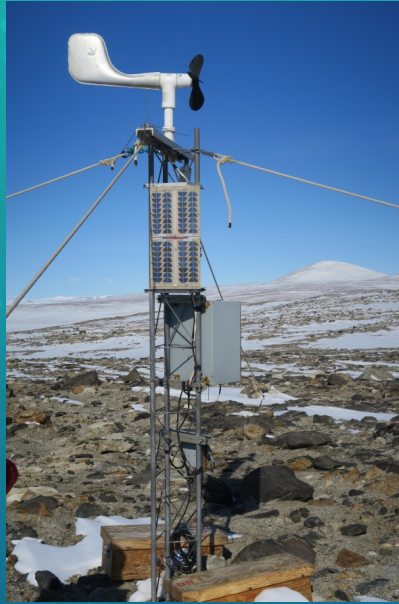
Purpose: Fix UHF transmission issues, raise lower instruments

Notes: Unsuccessful in fixing transmission issues.
Lower instruments raised.

PART I:

Marble Pt I and II

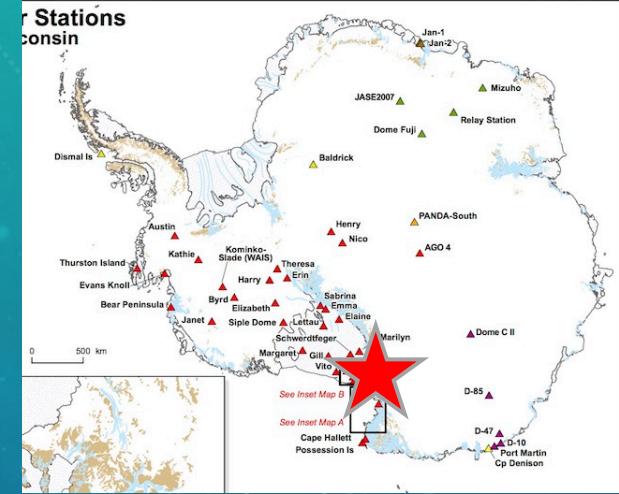
- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!



Marble Pt I



Marble Pt II



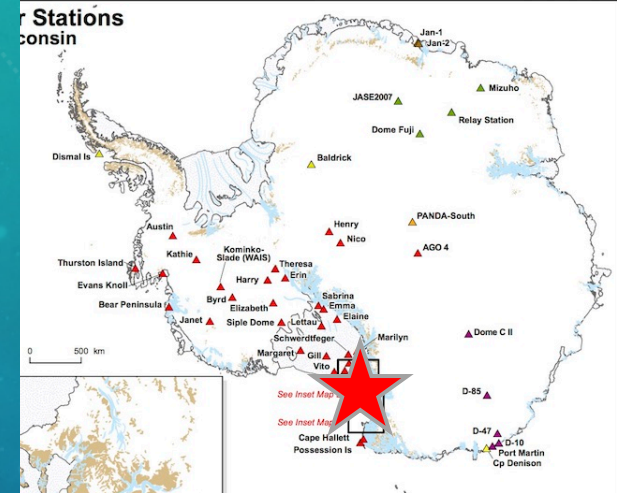
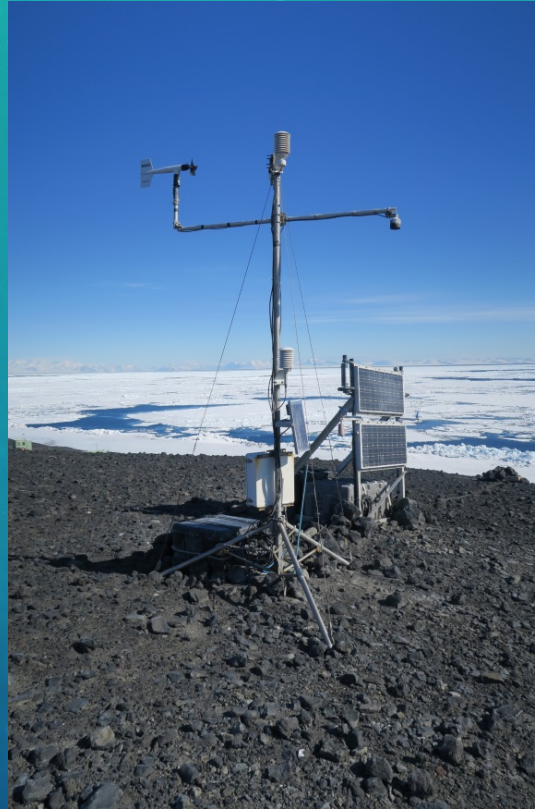
Purpose: Station checkups

Notes: All is well!

PART I:

- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!

Cape Bird



Purpose: Station checkup

Notes: All is well!

PART I:

Minna Bluff

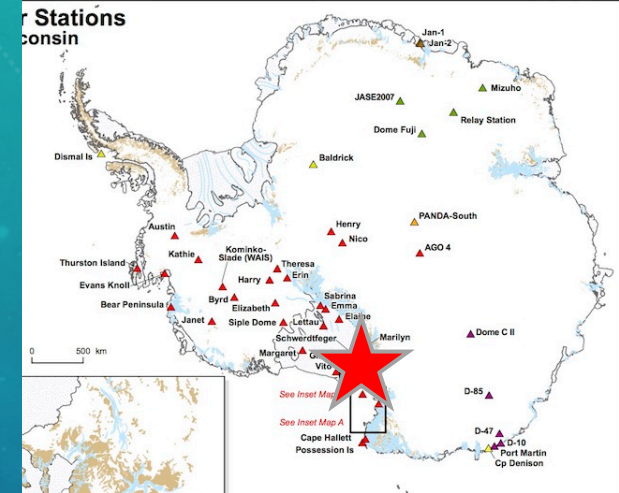
- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!



Before



After



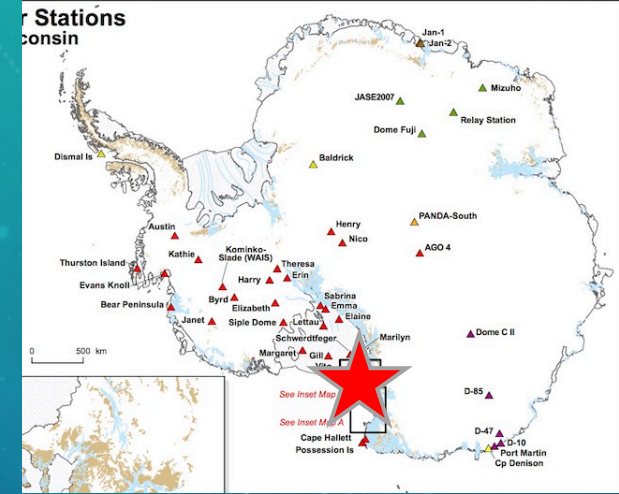
Purpose: Station checkup

Notes: Lots of riming, noticed tilt of station. Went back with riggers later in season to reinstall tower, install new temperature sensor.

PART I:

- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!

White Island



Purpose: Station checkup

Notes: All is well!

PART I:

Phoenix

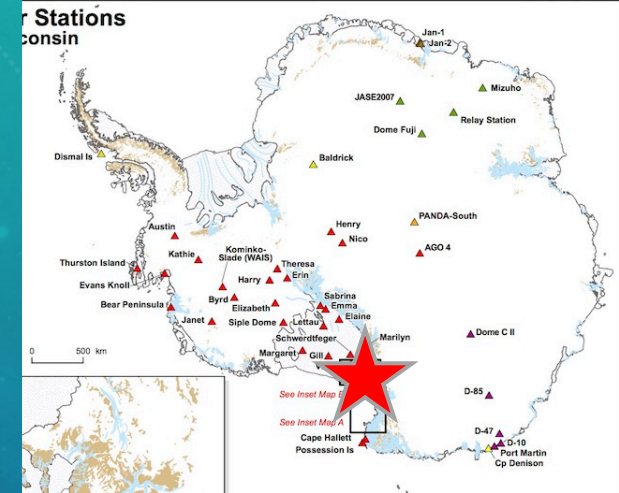
- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!



Install



Final visit



Purpose: Station install

Notes: After install in Nov., issue found with power system. New power system installed in Jan. Currently not transmitting.

PART I:

- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!

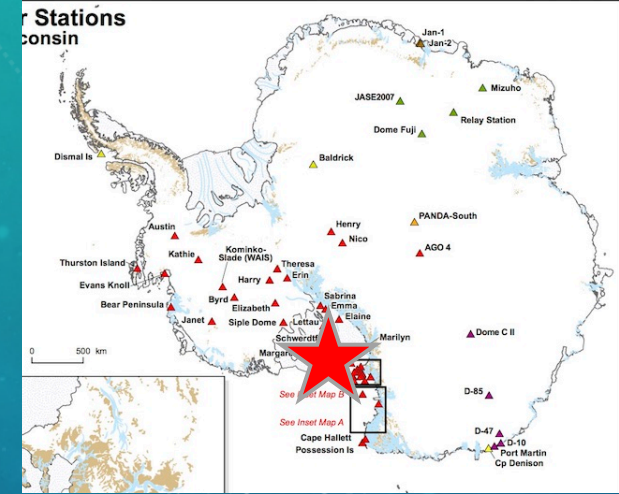
Gill



Before



After



Purpose: Station raise, replace pressure sensor

Notes: Successful raise, but needed to revisit due to issue in pressure calibration values in program. Unable to revisit.

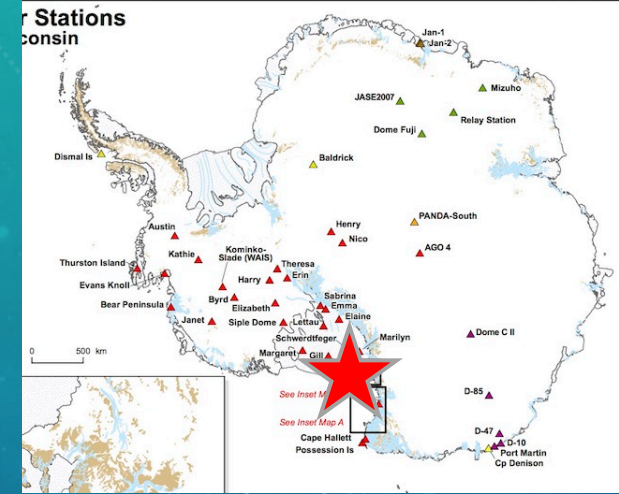
PART I:

- Sites visited
 - Lorne
 - Marble Pt I and II
 - Cape Bird
 - Minna Bluff
 - White Island
 - Phoenix
 - Gill
 - Alexander Tall Tower!

Alexander Tall Tower!



Alexander Tall Tower!



Purpose: Station inspection with riggers

Notes: All is well. Second visit to install new ADG sensor.

PART II:

Pegasus North

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



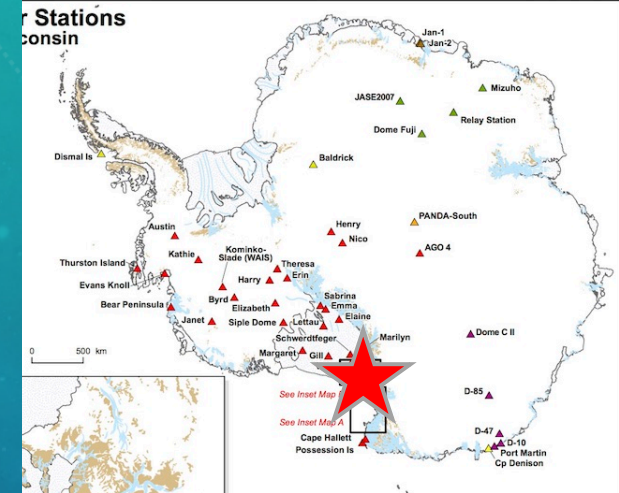
Before



After

Purpose: Remove station.

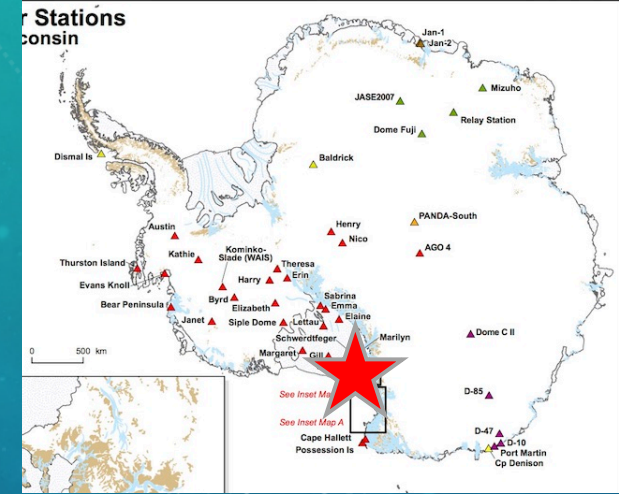
Notes: Station successfully removed.



PART II:

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll

Linda



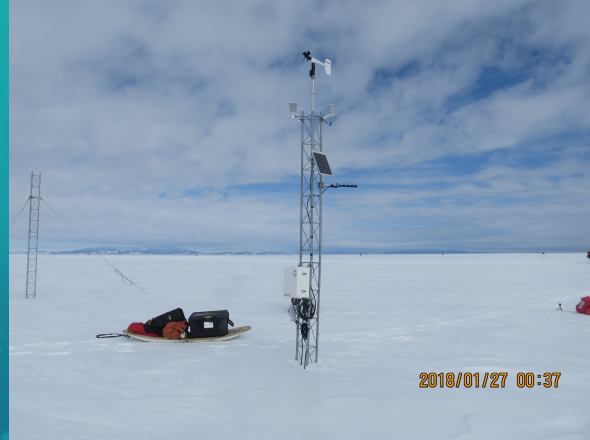
Purpose: Station check, troubleshoot pressure sensor issues

Notes: Station revisited to install Paroscientific pressure sensor.

PART II:

Willie Field

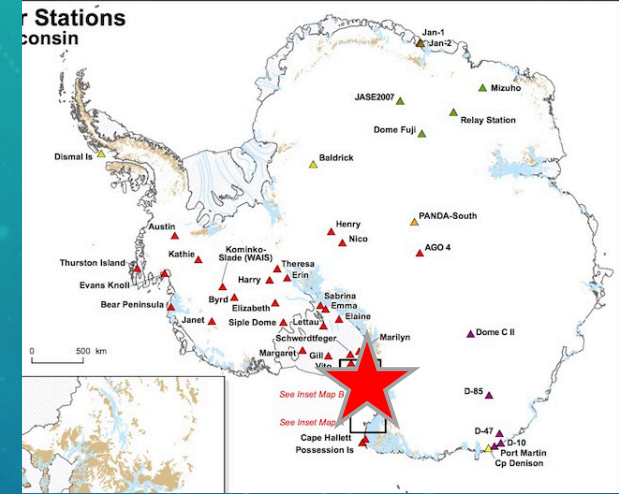
- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



Before



After



Purpose: Swap power system, raise lower temperature and enclosure

Notes: Success!

PART II:

Kathie

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



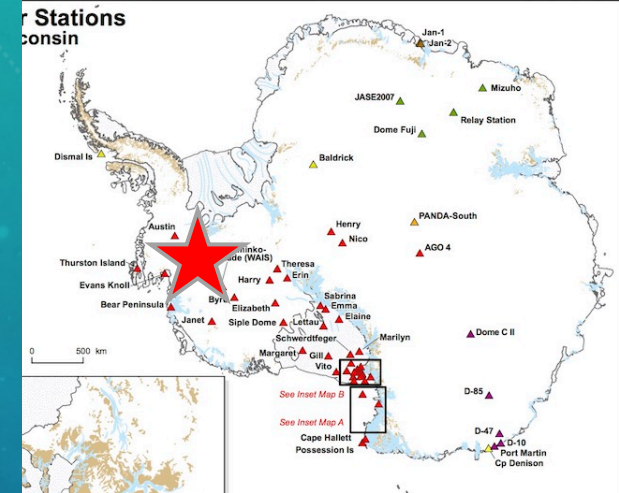
Before



After

Purpose: Raise the station

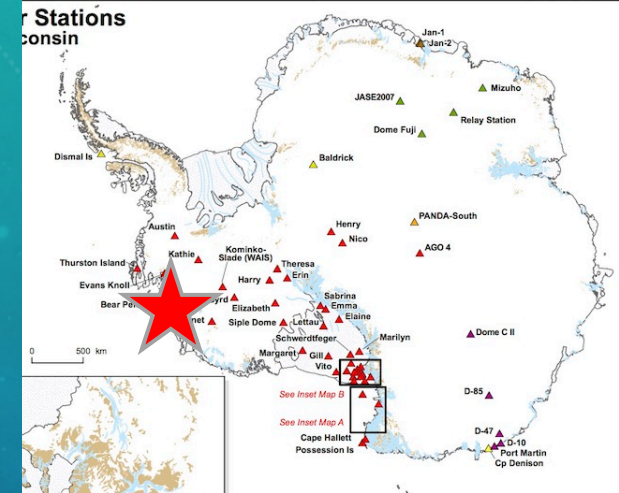
Notes: Success!



PART II:

Bear Peninsula

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - **Bear Peninsula**
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



Purpose: Station checkup, swap data cards

Notes: Need to revisit to replace guy wire, wind monitor

PART II:

Harry

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



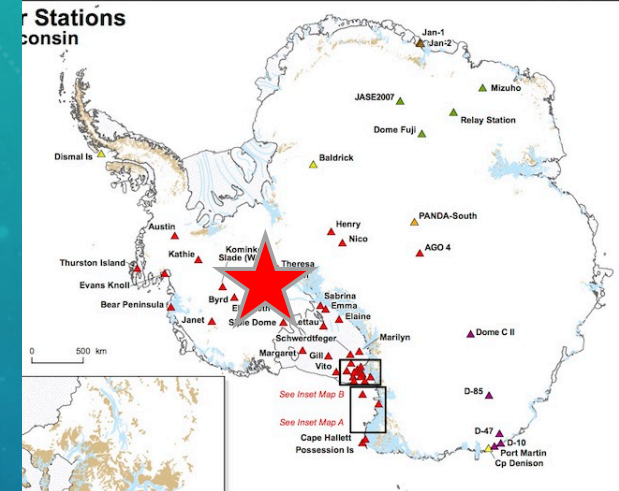
Before



After

Purpose: Raise power system and lower instruments, install boom with ADG and solar radiation sensor, check pressure issues

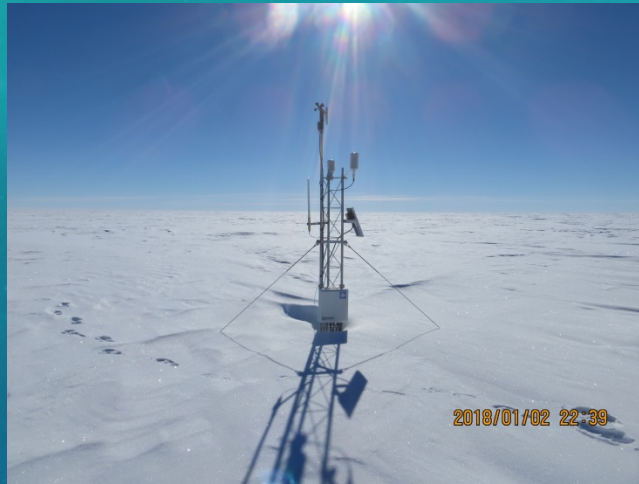
Notes: New instruments successfully installed. Pressure issue not resolved.



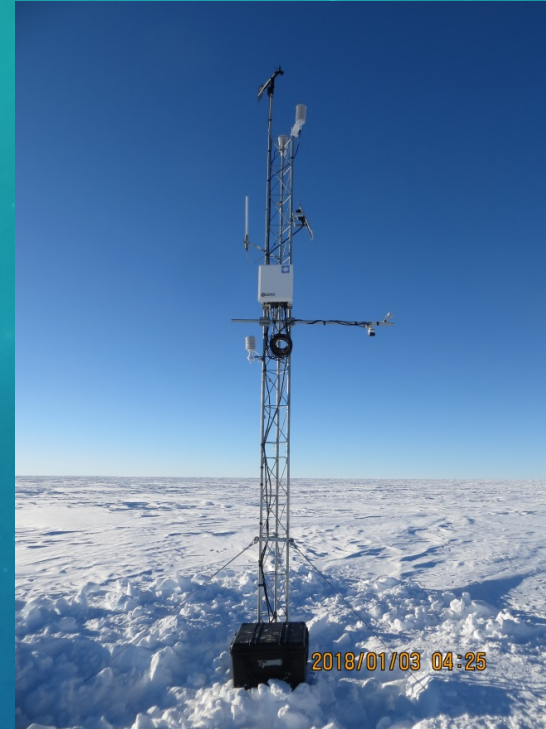
PART II:

Austin

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



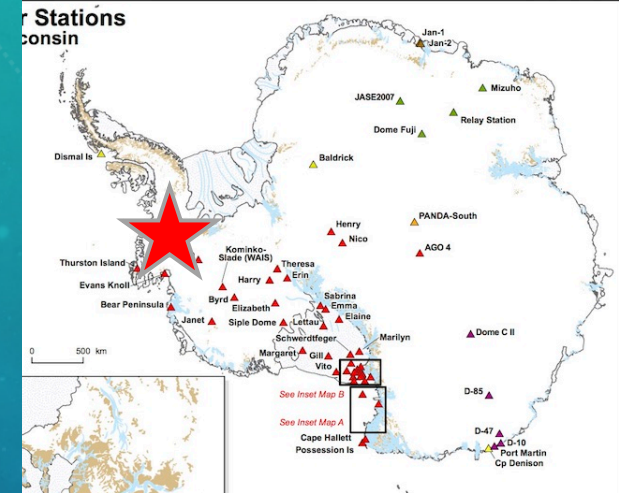
Before



After

Purpose: Raise station, swap power system

Notes: Very buried but successfully raised. Station not transmitting; possibly issue with Argos transmitter.



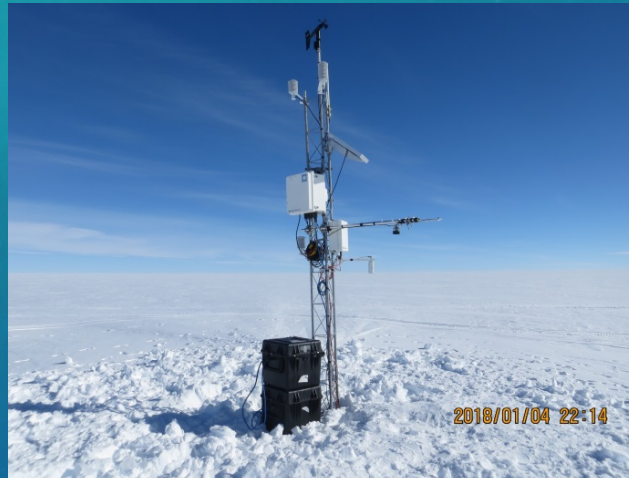
PART II:

Kominko-Slade

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



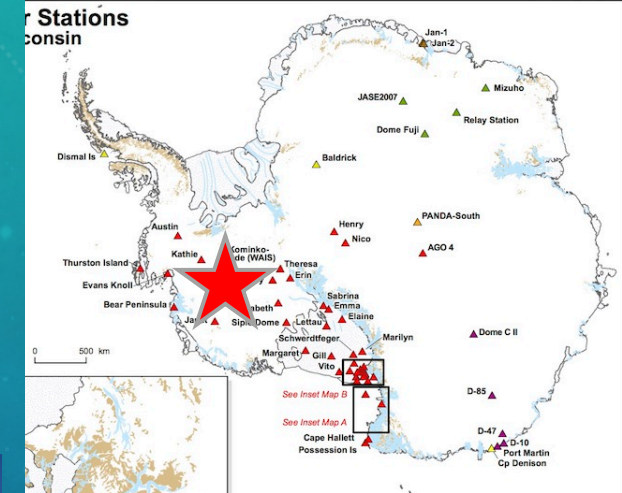
Before



After

Purpose: Raise station

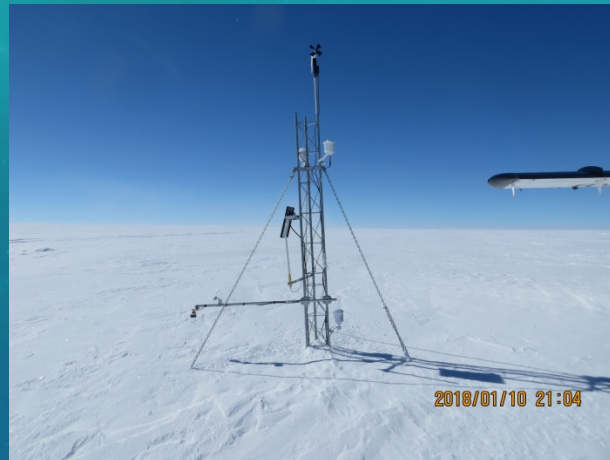
Notes: Success!



PART II:

Janet

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



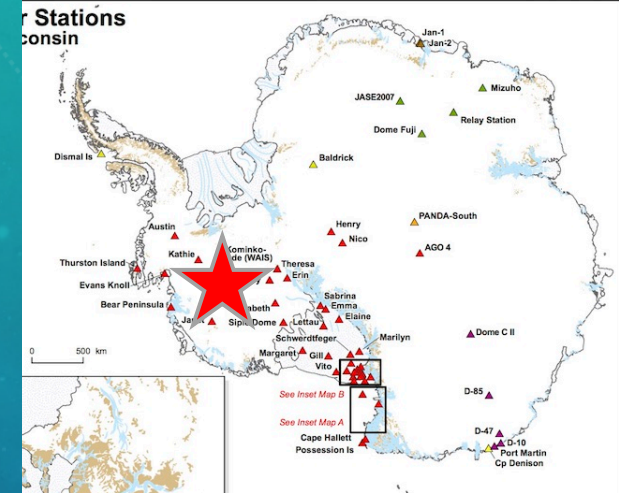
Before



After

Purpose: Raise station

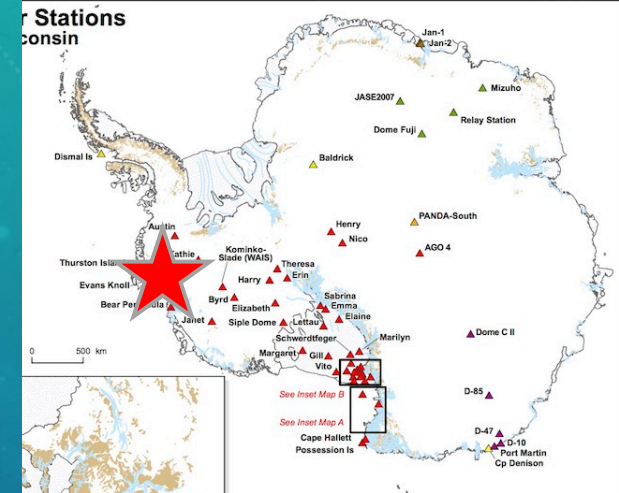
Notes: Success!



PART II:

Evans Knoll

- Sites visited from McMurdo
 - Pegasus North
 - Linda
 - Willie Field
- Sites visited from WAIS
 - Kathie
 - Bear Peninsula
 - Harry
 - Austin
 - Kominko-Slade
 - Janet
 - Evans Knoll



Purpose: Swap RM Young wind monitor for Taylor high wind speed system

Notes: Crevasse... Yikes! Unable to safely reach AWS.

PART III

Elaine

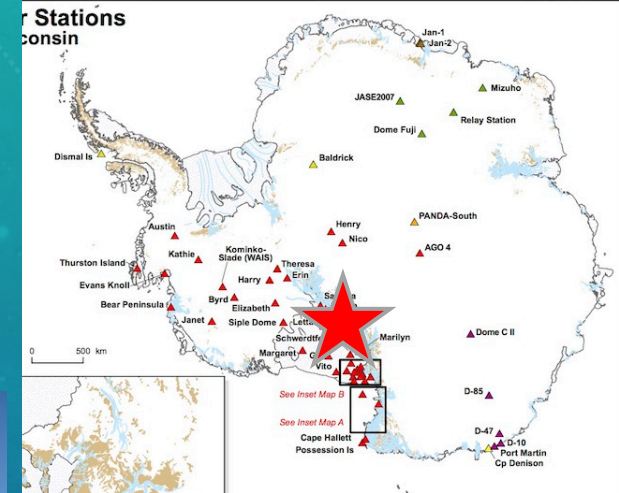
- Sites visited
 - Lorne
 - Elaine
 - Windless Bight
 - Alexander Tall Tower!
 - Lorne
 - Minna Bluff
 - Willie Field (install Madison College Polar Climate and Weather Station)



Before



After



Purpose: Raise station

Notes: Success!

PART III

Windless Bight

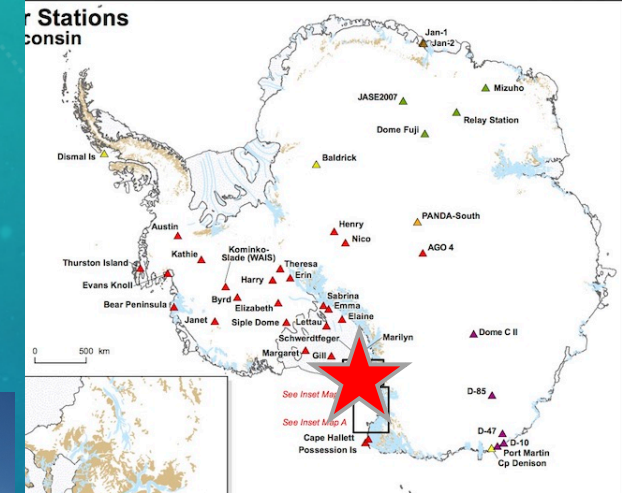
- Sites visited
 - Lorne
 - Elaine
 - Windless Bight
 - Alexander Tall Tower!
 - Lorne
 - Minna Bluff
 - Willie Field (install Madison College Polar Climate and Weather Station)



Before



After



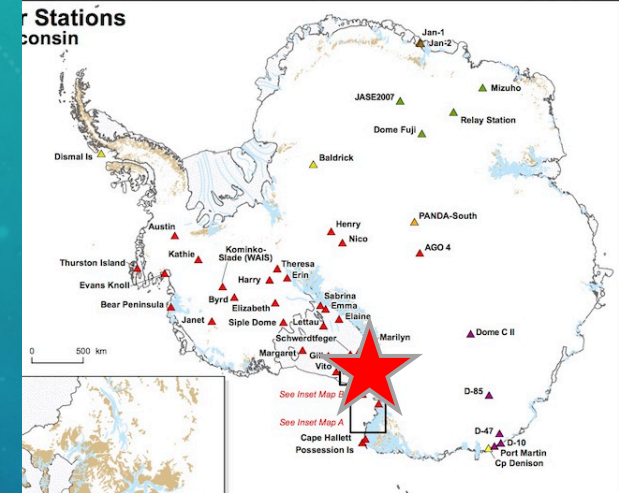
Purpose: Reinstall instruments on new tower ~30 ft away

Notes: Success (after 2 tries)!

PART III

Willie Field PCWS

- Sites visited
 - Lorne
 - Elaine
 - Windless Bight
 - Alexander Tall Tower!
 - Lorne
 - Minna Bluff
 - Willie Field
(install Madison College Polar Climate and Weather Station)



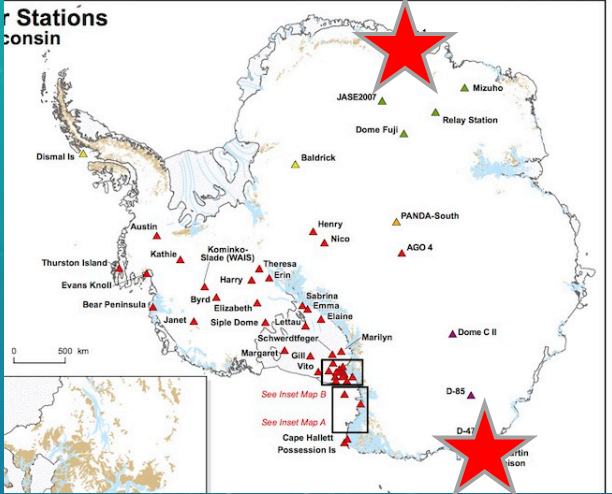
Purpose: Install electronics board at new Willie Field PCWS site

Notes: Installed on very last night of field season! Board is running but not transmitting data.

OTHER AWS SITES

D-10: Update program to use relative humidity temperature for upper temperature. Thanks to Victor Reyesmar and Jonathan Wille for their field servicing.

AWS1 and AWS2: 2 new tripod AWS installed for project with Jan Lenaerts. Thanks to Jan Lenaerts and Stef Lhermitte for servicing. The funding for this project was provided by the Royal Netherlands Meteorological Institute (KNMI) and the Delft University of Technology.



AWS1



AWS2





ACKNOWLEDGEMENTS

Many thanks go to the groups that support our ventures to our AWS, including but not limited to the United States Antarctic Program flight coordinators, Antarctic Support Contract, Kenn Borek Air, PHI Helicopters, the 109th New York Air National Guard, and our international partners at France, Australia, the United Kingdom, Japan, New Zealand, and elsewhere. This material is based upon work supported by the National Science Foundation, grant no. ANT-1543305.