



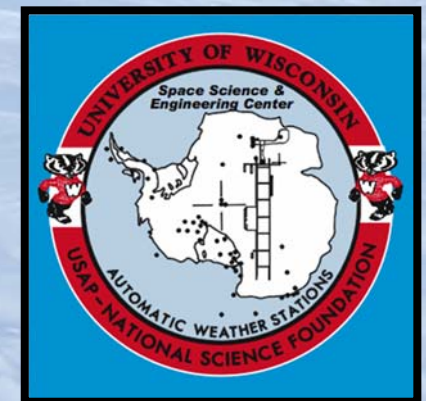
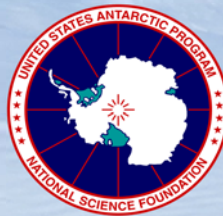
The 2013-2014  
Antarctic Automatic Weather Station Network:  
The Argos Network Segment

**Matthew Lazzara<sup>1</sup>, Lee Welhouse<sup>1</sup>, David Mikolajczyk<sup>1</sup>, Linda Keller<sup>1,2</sup>,  
Jonathan Thom<sup>1</sup>, George Weidner<sup>2</sup>, Melissa Nigro<sup>3</sup> & John Cassano<sup>3</sup>**

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

*<sup>2</sup>Dept. of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison*

*<sup>3</sup>Cooperative Institute for Research in Environmental Sciences and Dept. of Atmospheric and Oceanic Science, University of Colorado-Boulder*



# Outline

- AMRC/AWS Personnel
- 2013-14 Field Season Overview
  - Accomplishments
  - Setbacks
- Argos Network Update
- Argos Transmission Information
- Data Relay
- Future Plans



# 2013-14 Field Team



Dave  
Mikolajczyk



Dr. John Cassano



Lee Welhouse

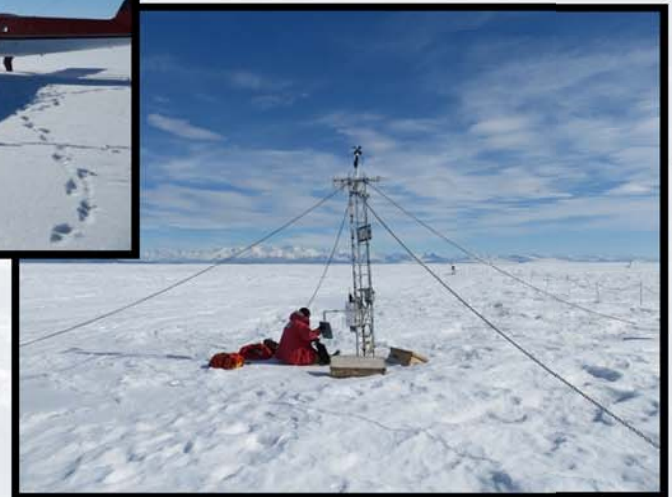
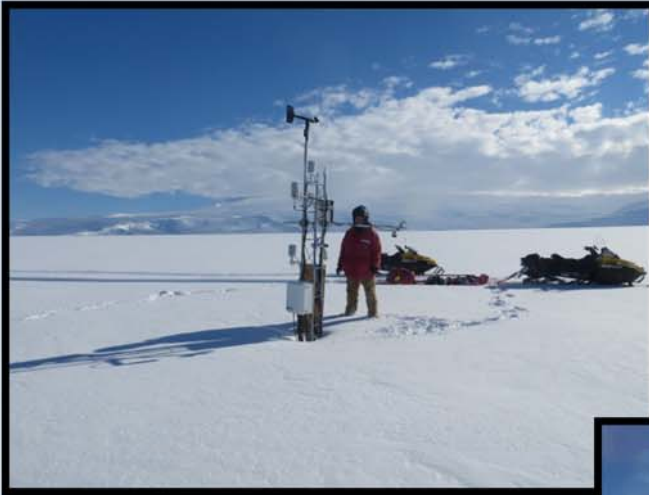


Dr. Melissa Nigro

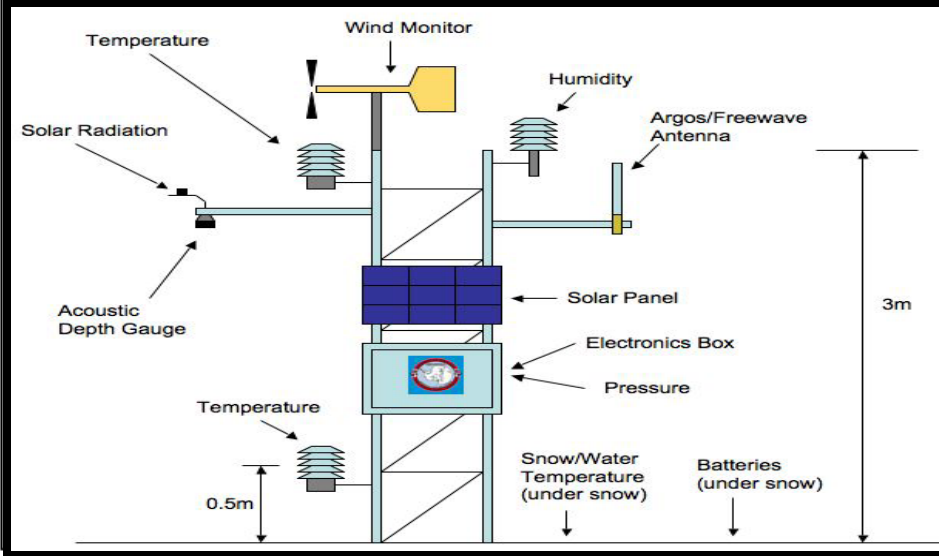
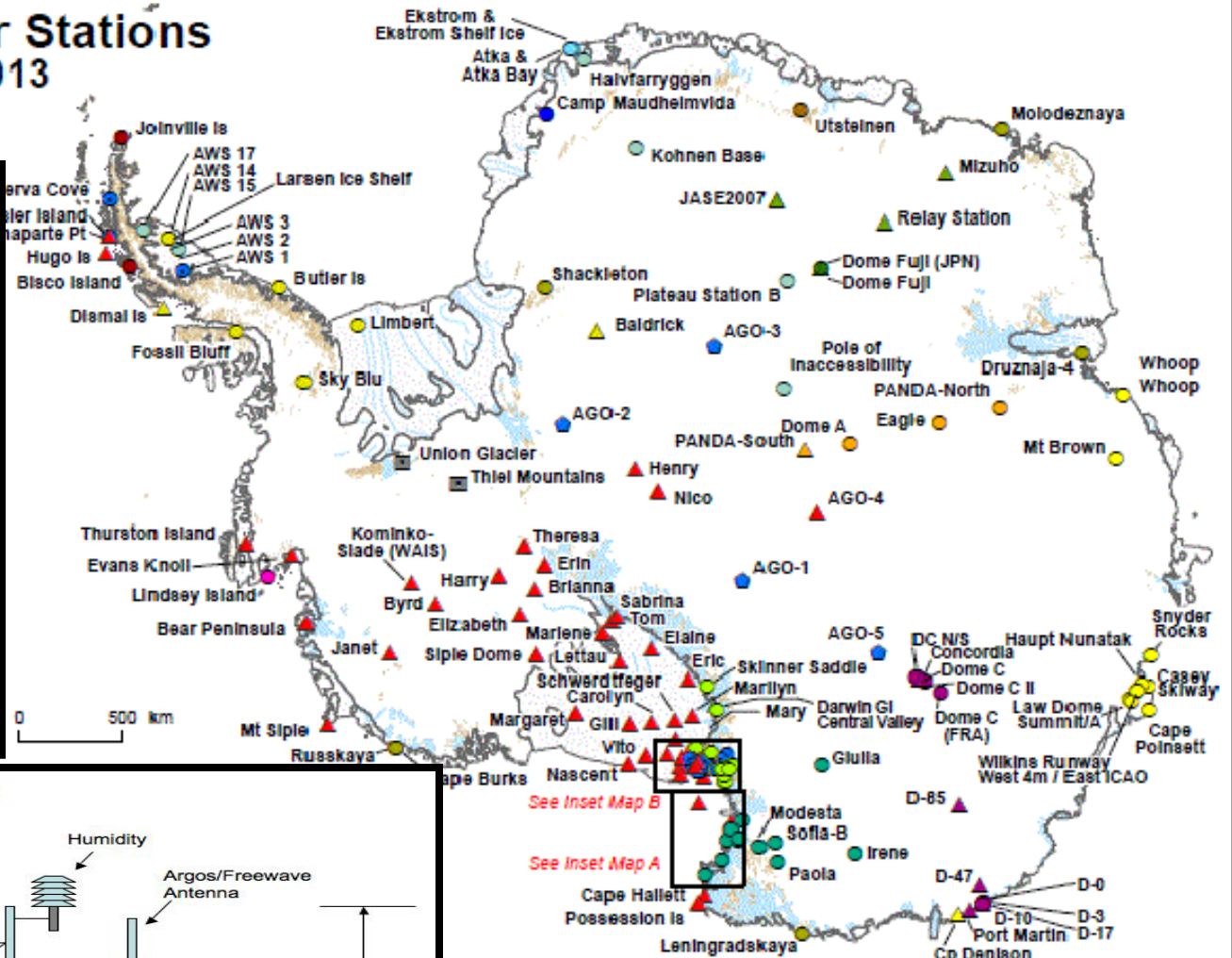




# Field Season 2013-2014



# Automatic Weather Stations Antarctica - 2013

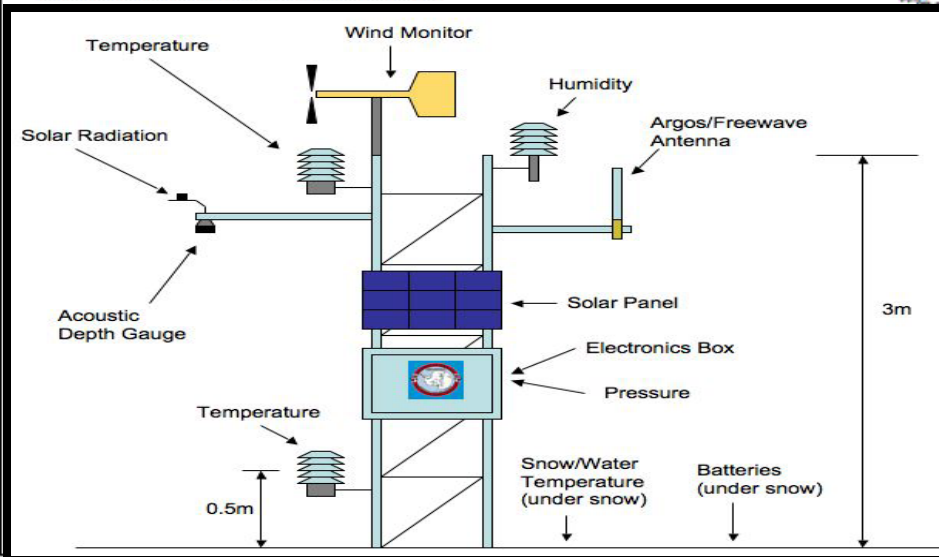
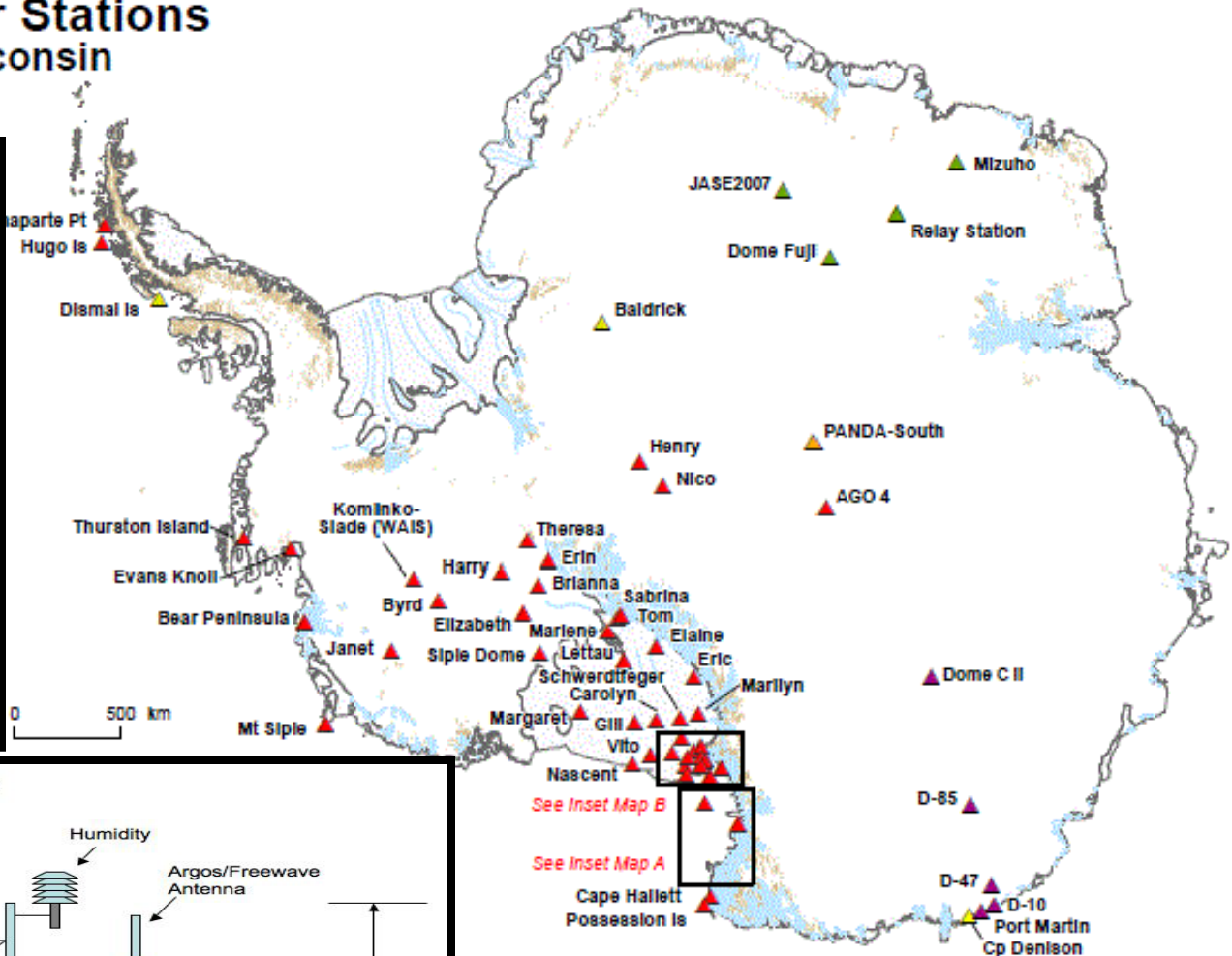


- | United States AWS         |                       | International AWS |  |
|---------------------------|-----------------------|-------------------|--|
| ▲ Univ. of Wisconsin (UW) | ● Australia           | ● New Zealand     |  |
| ▲ UW / Australia          | ● Belgium/Netherlands | ● Russia          |  |
| ▲ UW / China              | ● Brazil              | ● South Korea     |  |
| ▲ UW / France             | ● China/Australia     | ● United Kingdom  |  |
| ▲ UW / Japan              | ● Finland             |                   |  |
| ▲ UW / New Zealand        | ● France              |                   |  |
| ● AGO                     | ● Germany             |                   |  |
| ● SPAWAR                  | ● Italy               |                   |  |
| ● Other US                | ● Japan               |                   |  |
|                           | ● Netherlands         |                   |  |
- Other AWS**
- Commercial
- Coastline: ADD v4.1, 2003  
 2013\_AWS\_Sites\_ALL  
 July 2013 Sam Batzli SSEIC  
 University of Wisconsin-Madison  
 National Science Foundation ANT-094401-8

# Automatic Weather Stations

## University of Wisconsin

2013



- University of Wisconsin AWS**
- ▲ Univ. of Wisconsin (UW)
  - ▲ UW / Australia
  - ▲ UW / China
  - ▲ UW / France
  - ▲ UW / Japan
  - ▲ UW / New Zealand
  - ▲ UW / United Kingdom

Coastline: ADD v4.1, 2003  
 2013\_AWS\_Sites\_UW\_07\_09\_2013  
 July 2013 Sam Batzell SSEC  
 University of Wisconsin-Madison  
 National Science Foundation ANT-0944018

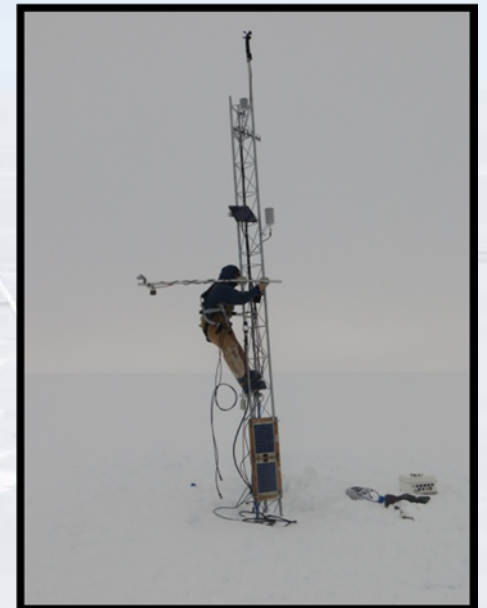


# 12 Argos Sites Visited

- 8 by UW/CU
  - **Schwerdtfeger AWS**: routine maintenance
  - **Pegasus North AWS**: switch to FreeWave comms
  - **Ferrell AWS**: dual Argos/FreeWave comms
  - **Linda AWS**: back online, switch to FreeWave comms
  - **Lettau AWS**: back online; last transmitted July 2011
  - **Tom AWS**: removal, pending reinstallation
  - **Sabrina AWS**: routine maintenance
  - **Margaret AWS**: routine maintenance
- 1 by Palmer Research Associate (Glenn Grant)
  - **Bonaparte Point AWS**: routine maintenance
- 3 collaborative visits by other national programs
  - Italy: **Manuela AWS**: routine maintenance
  - France: **D-10 AWS**: routine maintenance
  - Australia: **Cape Denison AWS**: routine maintenance

# Field Season Setbacks

- Government shutdown
  - WAIS field camp closed: unable to install 2 new AWS, service 4 existing AWS, remove 1 AWS
- Weather
  - Common issue
  - Traveling to AWS; to Pegasus Airfield



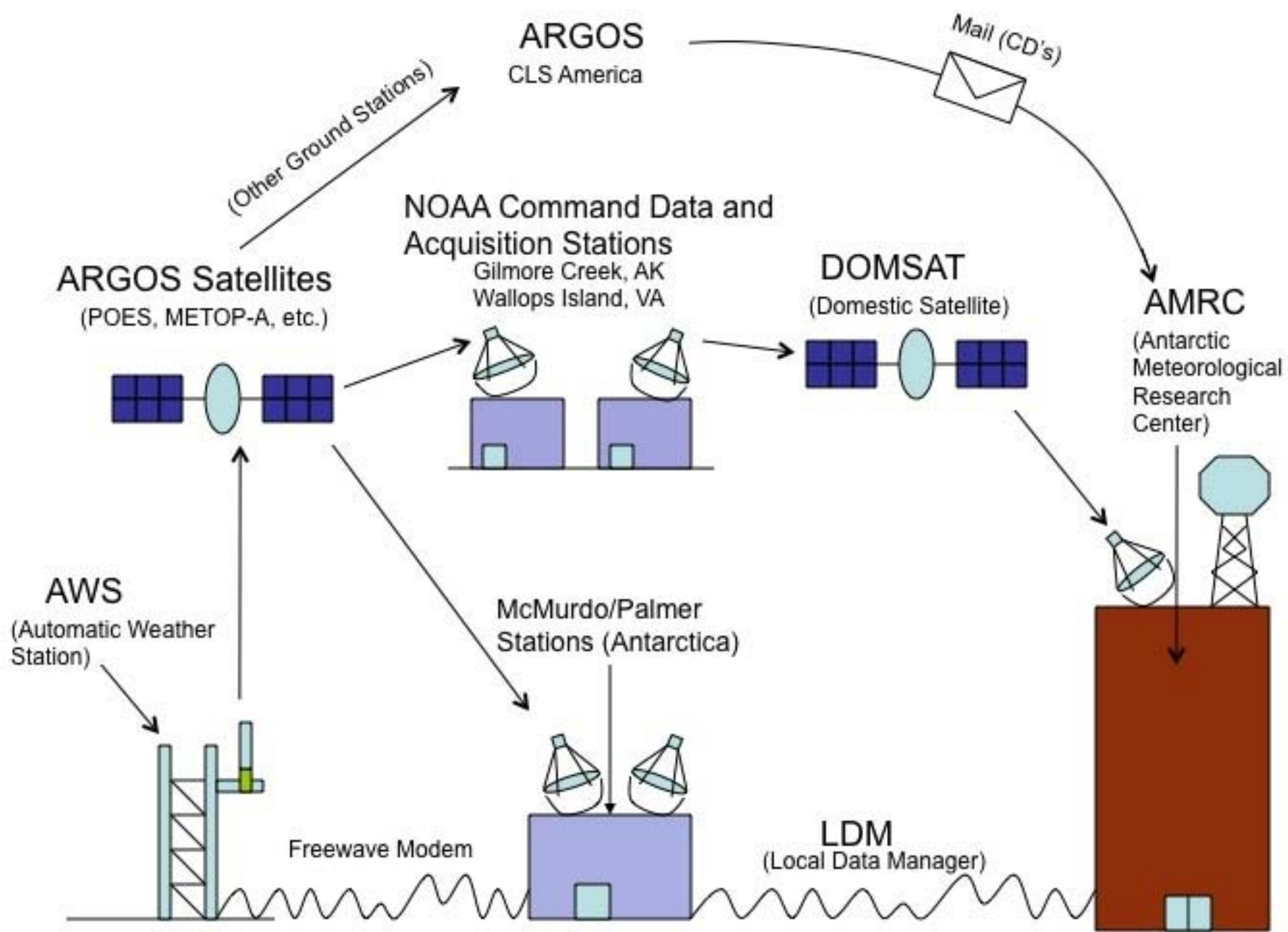


# Argos Operating Agency



- Collection and Location by Satellite (CLS)
- Based in Toulouse, France
  - Subsidiary of CNES (French Space Agency), and IFREMER (French Research Institute for Exploration of the sea)
  - Work with: NOAA (w/NASA), ESA, MDA, Eumetsat, JAXA and INPE
- The Data Collection System (DCS) on these satellites:
  - NOAA
    - -15, -16, -17, -18, -19
  - Metop
    - -A
    - -B
  - SARAL
- Transmissions:
  - 401.650 MHz  $\pm$  30 kHz





# Data Transmission via Argos

- Antenna
  - Laird Technologies FG3800
  - ~380-406 MHz
  - ~401 MHz for weather
- Transmitter
  - Campbell Scientific ST-21
  - Rated at -30C but works at colder temperatures



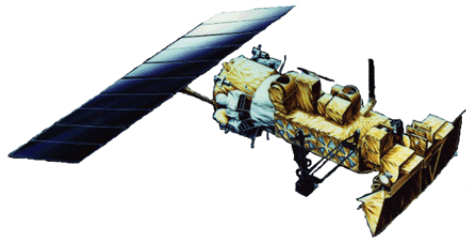
## Data Relay

- Real-time: McMurdo to SSEC via McIDAS ADDE server
- Archive: Available monthly on ftp



# Argos Data Relay

Data Collection Service (DCS)  
AWS Project 30+ year user!



Argos Satellite  
NOAA series  
(Metop series)



AWS Observations



**UW/SSEC**

Reception via

- HRPT
- GAC Relay
- (FRAC Relay)



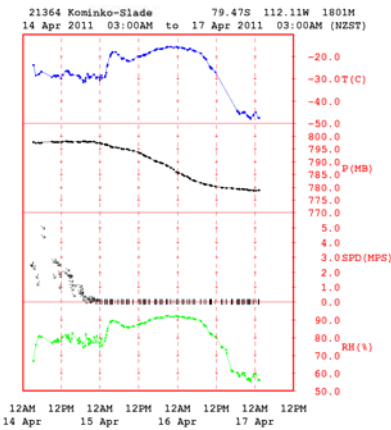
**McMurdo & Palmer  
Stations**



SSEC Desktop Ingestor (SDI)



AWS Decode Software



Distribution

Realtime at:

<http://amrc.ssec.wisc.edu>

Space Science & Engineering Center, UW-Madison




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### Surface Weather Observations

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#### Automatic Weather Station Observations

- [Meteorograms \(Time Series Plot\)](#)
- [Meteorograms Raw \(Time Series Plots\)](#)
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- [Weather Maps and Plots \(AWS\)](#)

#### Other Surface Observations

- [Meteorograms \(Time Series Plot\)](#)
- [Ship and Buoy Observations](#)
- [Text Listings](#)
- [Weather Maps and Plots \(Other\)](#)

#### Miscellaneous

- [Coded Synoptic Observations from South Pole](#)
- [Ice Runway METAR \(text\)](#)
- [Latest Hourly AWS Reports](#)
- [Pegasus METAR \(text\)](#)
- [Pegasus Radiation Obs](#)
- [South Pole METAR \(text\)](#)
- [Synoptic observations listing](#)

Real time

Web:

<http://amrc.ssec.wisc.edu>

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### Marlene

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ARGOS_#	JulianDate	Time (HHMMSS)	T (C)	F (MB)	SPD (MPS)	DIR (DEG)	RH (%)	LAT (deg)	LOX (deg)
8908	2014104	100033	-33.0	972.1	1.7	144	70.0	-83.6500	167.4000
8908	2014104	100034	-33.0	972.1	1.7	144	70.0	-83.6500	167.4000
8908	2014104	100035	-33.0	972.1	1.7	144	70.0	-83.6500	167.4000
8908	2014104	10032	-24.5	964.4	10.4	142	79.0	-83.6500	167.4000
8908	2014104	102034	-33.1	972.1	1.9	181	70.0	-83.6500	167.4000
8908	2014104	103034	-33.3	972.3	1.6	180	70.0	-83.6500	167.4000
8908	2014104	103035	-33.6	972.3	1.6	180	70.0	-83.6500	167.4000
8908	2014104	1033	-24.0	963.9	9.9	143	80.0	-83.6500	167.4000
8908	2014104	11031	-24.7	964.5	10.3	142	79.0	-83.6500	167.4000
8908	2014104	11032	-24.7	964.5	10.3	142	79.0	-83.6500	167.4000
8908	2014104	11033	-24.7	964.5	10.3	142	79.0	-83.6500	167.4000
8908	2014104	13033	-24.8	964.7	10.4	139	79.0	-83.6500	167.4000
8908	2014104	13034	-24.8	964.7	10.4	139	79.0	-83.6500	167.4000
8908	2014104	13035	-24.8	964.7	10.4	139	79.0	-83.6500	167.4000
8908	2014104	134034	-32.8	973.9	3.1	150	70.0	-83.6500	167.4000
8908	2014104	134035	-32.8	973.9	3.1	150	70.0	-83.6500	167.4000
8908	2014104	135033	-32.9	974.1	2.1	144	71.0	-83.6500	167.4000
8908	2014104	135034	-32.9	974.1	2.1	144	71.0	-83.6500	167.4000
8908	2014104	135035	-32.9	974.1	2.1	144	71.0	-83.6500	167.4000
8908	2014104	14035	-24.8	964.9	10.7	137	79.0	-83.6500	167.4000
8908	2014104	144032	-32.7	974.1	2.6	156	70.0	-83.6500	167.4000

Archive

<ftp://amrc.ssec.wisc.edu>

<ftp://aws.ssec.wisc.edu>

# Future of Argos AWS

- New installs
  - West Antarctica, 2014-15 field season
- Reinstalls
  - Emma, Port Martin, Nico, Henry
  - Replacements at D85 and D47
  - Side-by-side at Dome C
- Repairs
  - Thurston Island, Sabrina, etc.



# Acknowledgments

- **Antarctic AWS Observations:**

The authors appreciate the support of the University of Wisconsin-Madison Automatic Weather Station Program for the data set, data display, and information, NSF grant numbers ANT-0944018 and ANT-1245663.

- Thanks to NSF, ASC, 109<sup>th</sup> NY Air National Guard, Ken Borek Air, PHI Helicopters, Antarctic community, data users.
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