

ANTARCTIC AUTOMATIC WEATHER STATION DATA USAGE IN ECMWF REANALYSIS DATA SETS

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Outline

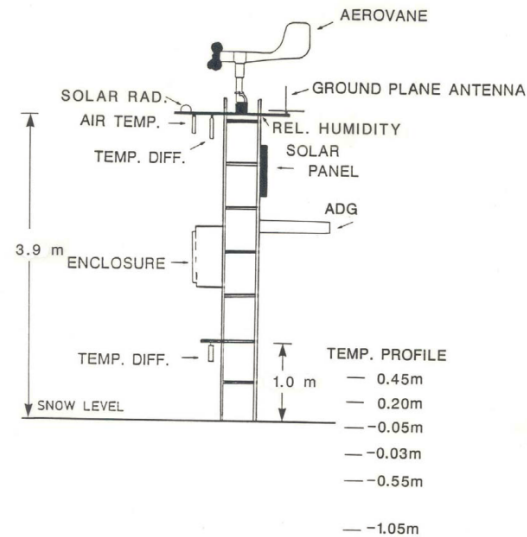
- ECMWF
- Automatic Weather Stations
- ECMWF Archive
- Data Usage
- Conclusions

ECMWF Description

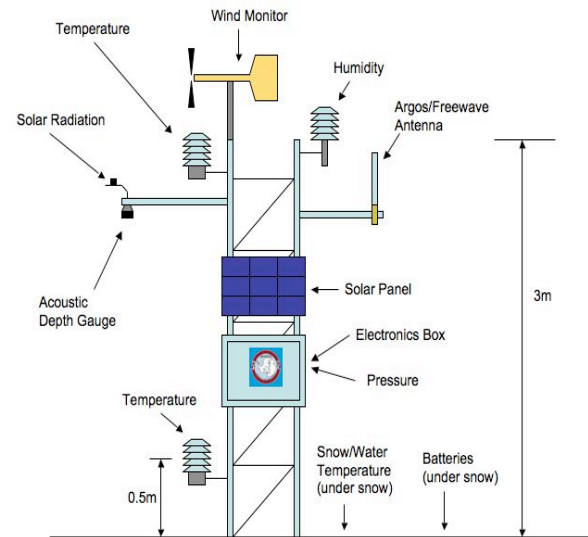
- ERA-40
- Standard Reanalysis used due to high accuracy
- Determining accuracy is difficult
 - Uncertain which observations are use
 - Archive seeks to indicate observation usage

Automatic Weather Stations

- Standard Meteorological observations of pressure, wind speed and direction, temperature
- Length of observations varies by station with some extending back 30 years



AWS2B



CR1000

ECMWF Archive Plan

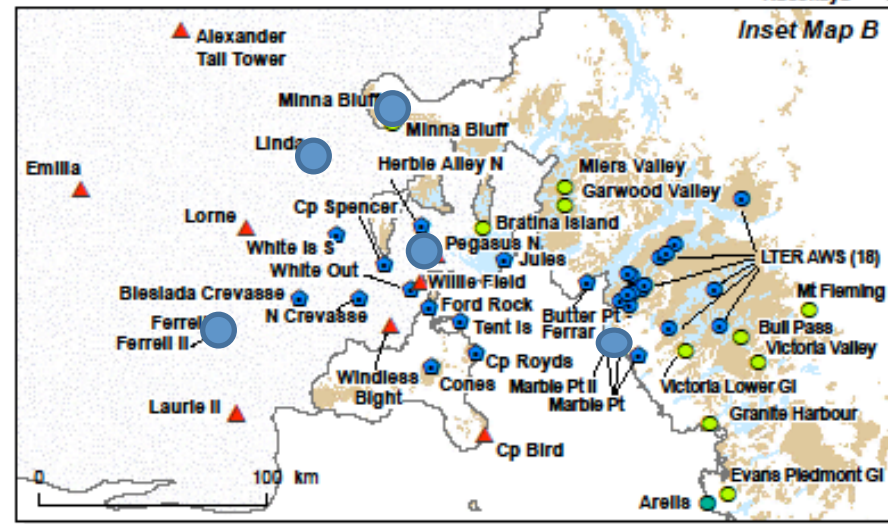
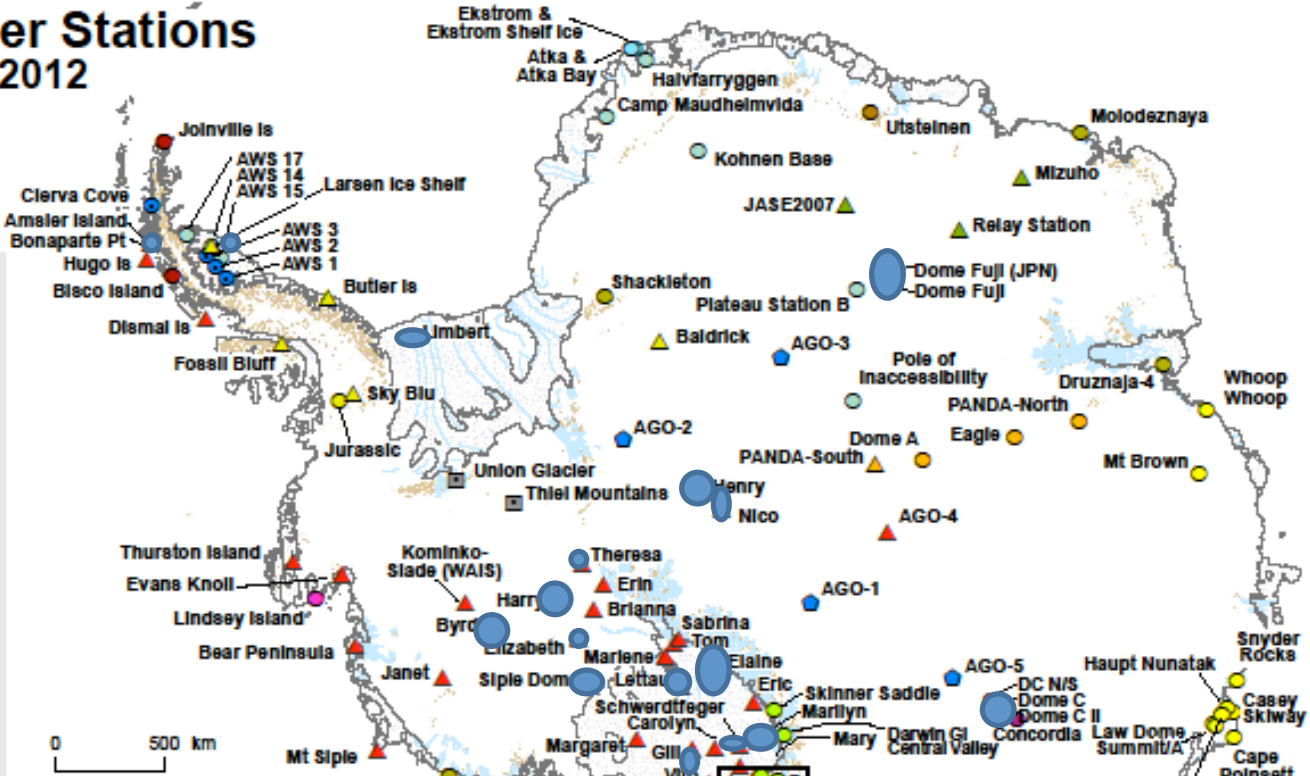
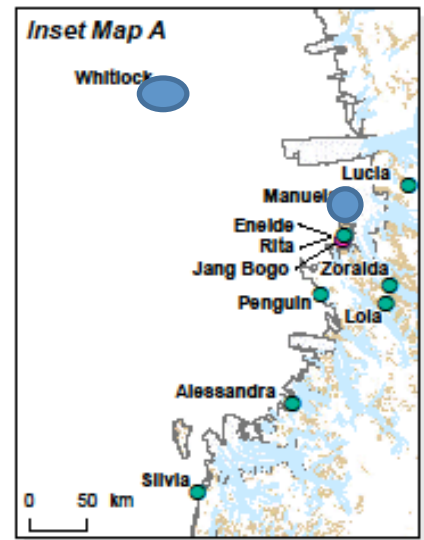
Table 2.1 Observations available for ERA-40

Data supplier	Data source/ type	Period	Availability
ECMWF	Operational GTS data Reception via GTS including surface, radiosonde, pilot, dropsonde, profiler, aircraft and cloud motion wind data Special datasets FGGE Final Level 2b ALPEX Level 2b	1979-2001 1979 1982	Public ¹
NCAR	Automatic Antarctic stations from University of Wisconsin	1980-1998	Public

ECMWF Archive

- European Centre for Medium-Range Weather Forecasts. 2009. *ERA-40 Global Observational Feedback Record Reports*. Research Data Archive at the National Center for Atmospheric Research, Computational and Information Systems Laboratory.
- Indicates all data sources with WMO ID's were included beyond 1998
- Correlations indicate observations have been used

Automatic Weather Stations Antarctica - 2012



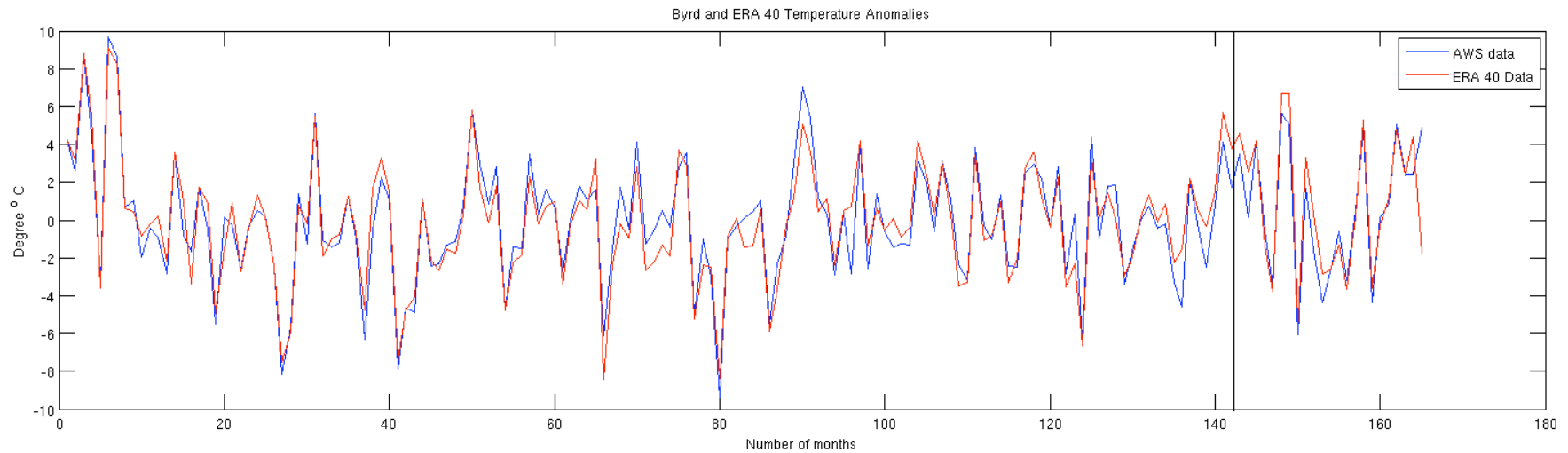
United States AWS		International AWS	
▲ Univ. of Wisconsin (UW)	● Australia	● New Zealand	● Russia
▲ UW / Australia	● Belgium/Netherlands	● Brazil	● South Korea
▲ UW / China	● France	● China/Australia	● United Kingdom
▲ UW / France	● Germany	● Japan	
▲ UW / Japan	● Italy		
▲ UW / New Zealand	● Japan		
● AGO	● Netherlands		
● SPAWAR			
● Other US			

Other AWS	
■ Commercial	

Coastline: ADD v4.1, 2009
 2012_AWS_Sites_ALL
 August 2012 Sam Batzli SSEC
 University of Wisconsin-Madison
 National Science Foundation ANT-0944018

Station Correlations

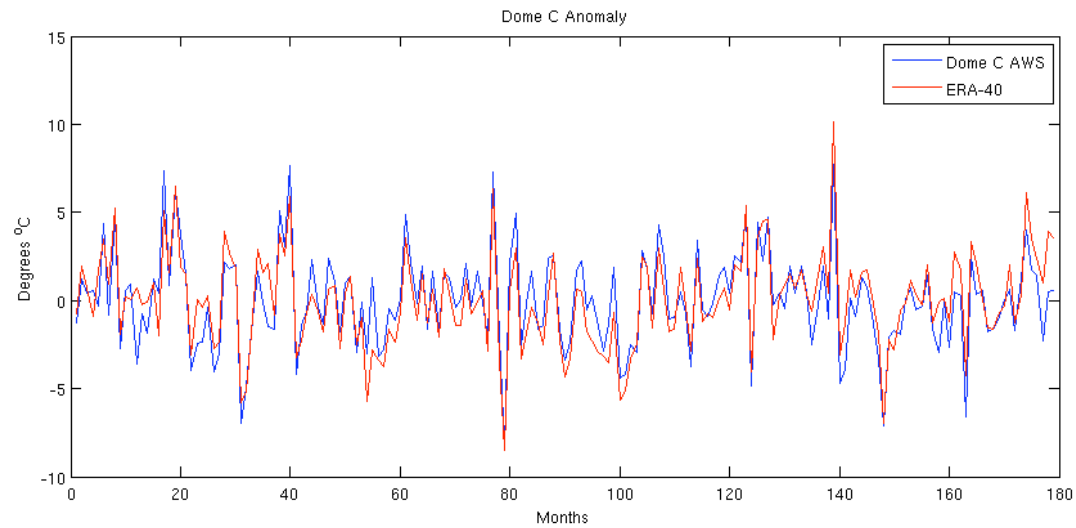
Byrd



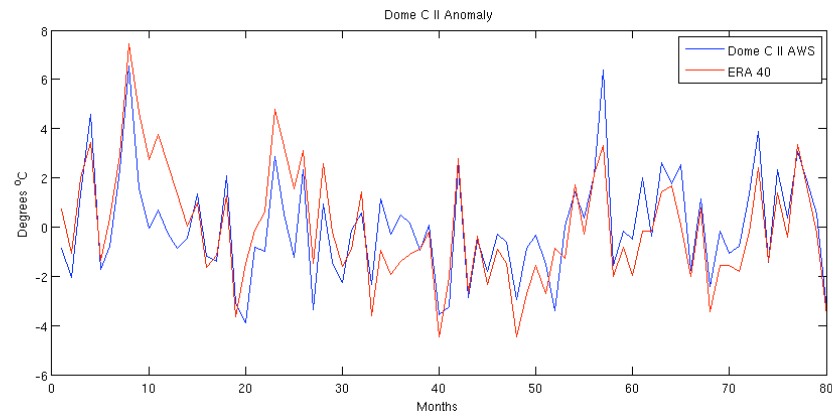
- Extremely good correlations
- Including after 1998 as marked by the line

Station Correlations

Dome C



Dome C 2



Conclusions

- Automatic Weather Station data all used from 1980-1998
- WMO stations used beyond 1998
- Likely applies to more recent ERA-Interim as well
- A means of determining if data is being utilized would be useful

Thank you!

- European Centre for Medium-Range Weather Forecasts. 2009. *ERA-40 Global Observational Feedback Record Reports*. Research Data Archive at the National Center for Atmospheric Research, Computational and Information Systems Laboratory.
- *ERA-40 Project Report Series No. 17* Kållberg, P., A. Simmons, S. Uppala and M. Fuentes:
The ERA-40 archive. [Revised October 2007] September 2004
- This material is based upon work supported by the National Science Foundation Grant No. ANT-0944018