

Dr. Gert König-Langlo



ALFRED-WEGENER-INSTITUT
HELMHOLTZ-ZENTRUM FÜR POLAR-
UND MEERESFORSCHUNG

Weather service in the Dronning Maud Land and beyond



Neumayer, Germany

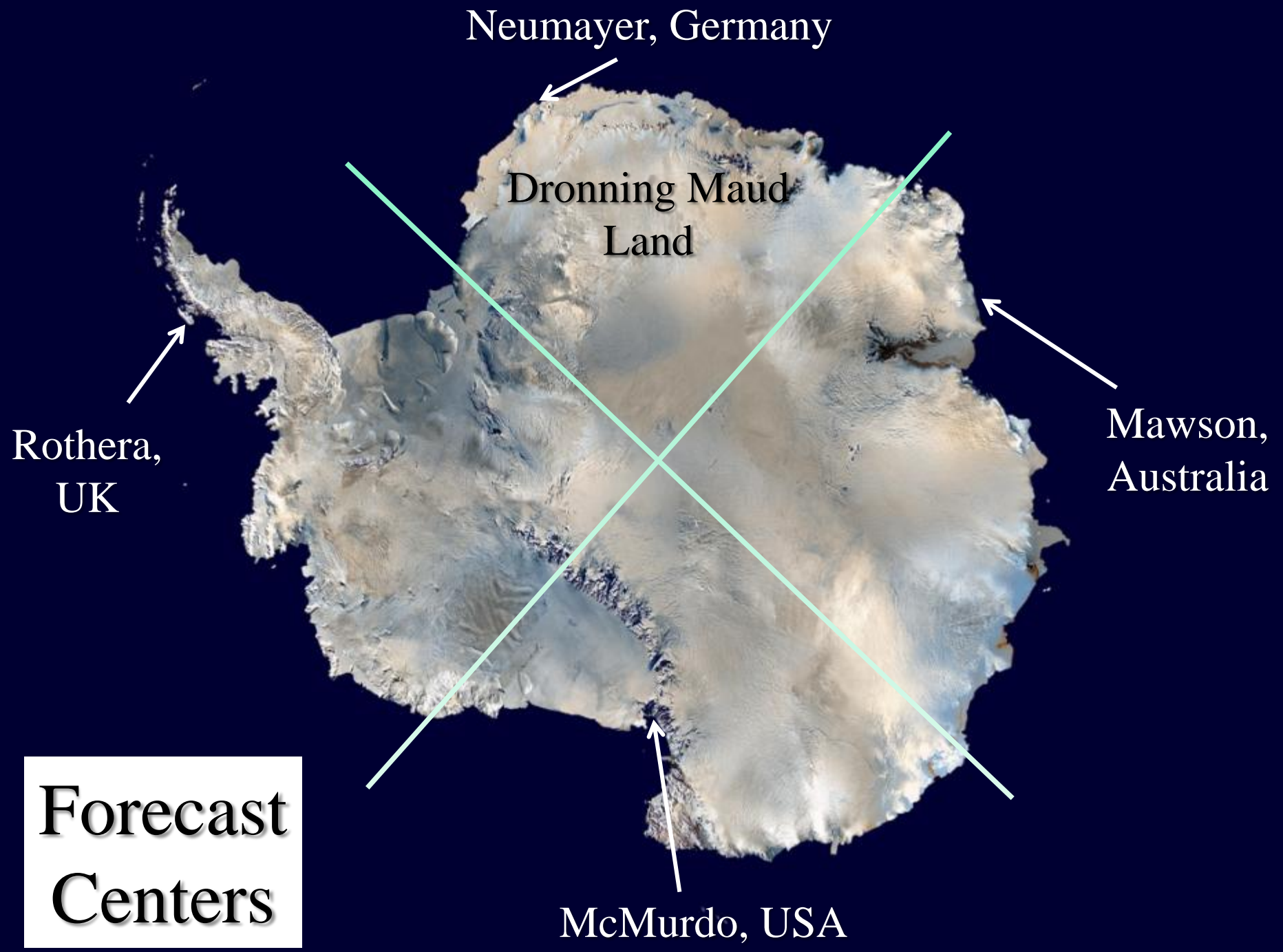
Dronning Maud
Land

Rothera,
UK

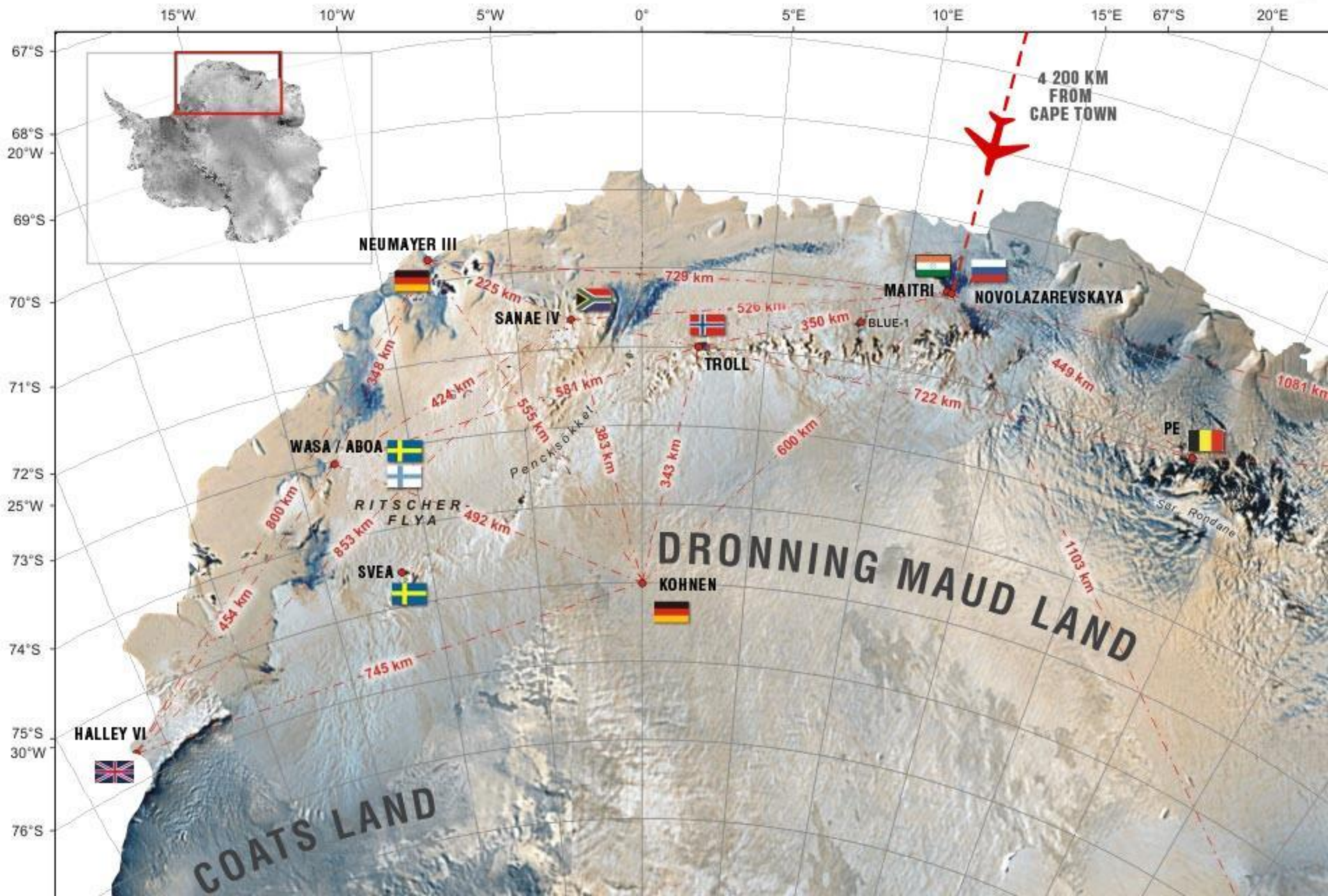
Mawson,
Australia

Forecast
Centers

McMurdo, USA



DRONNING MAUD LAND AIR NETWORK

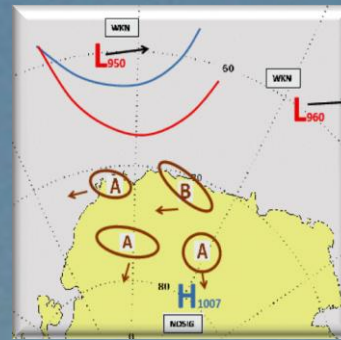
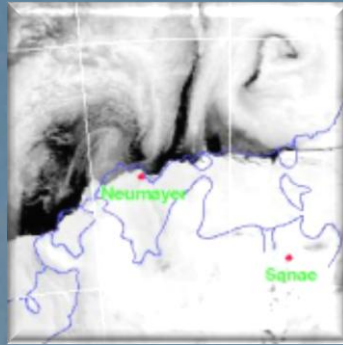


In Situ Data

Tools & Models

Forecast Products

Verification & Outlook



In Situ Data

Soundings

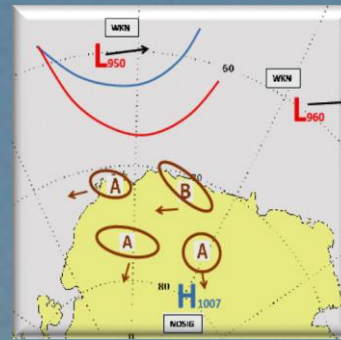
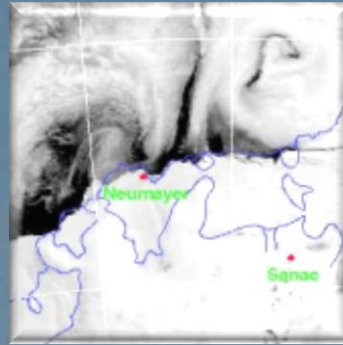
Synops

AWS

Tools & Models

Forecast Products

Verification & Outlook

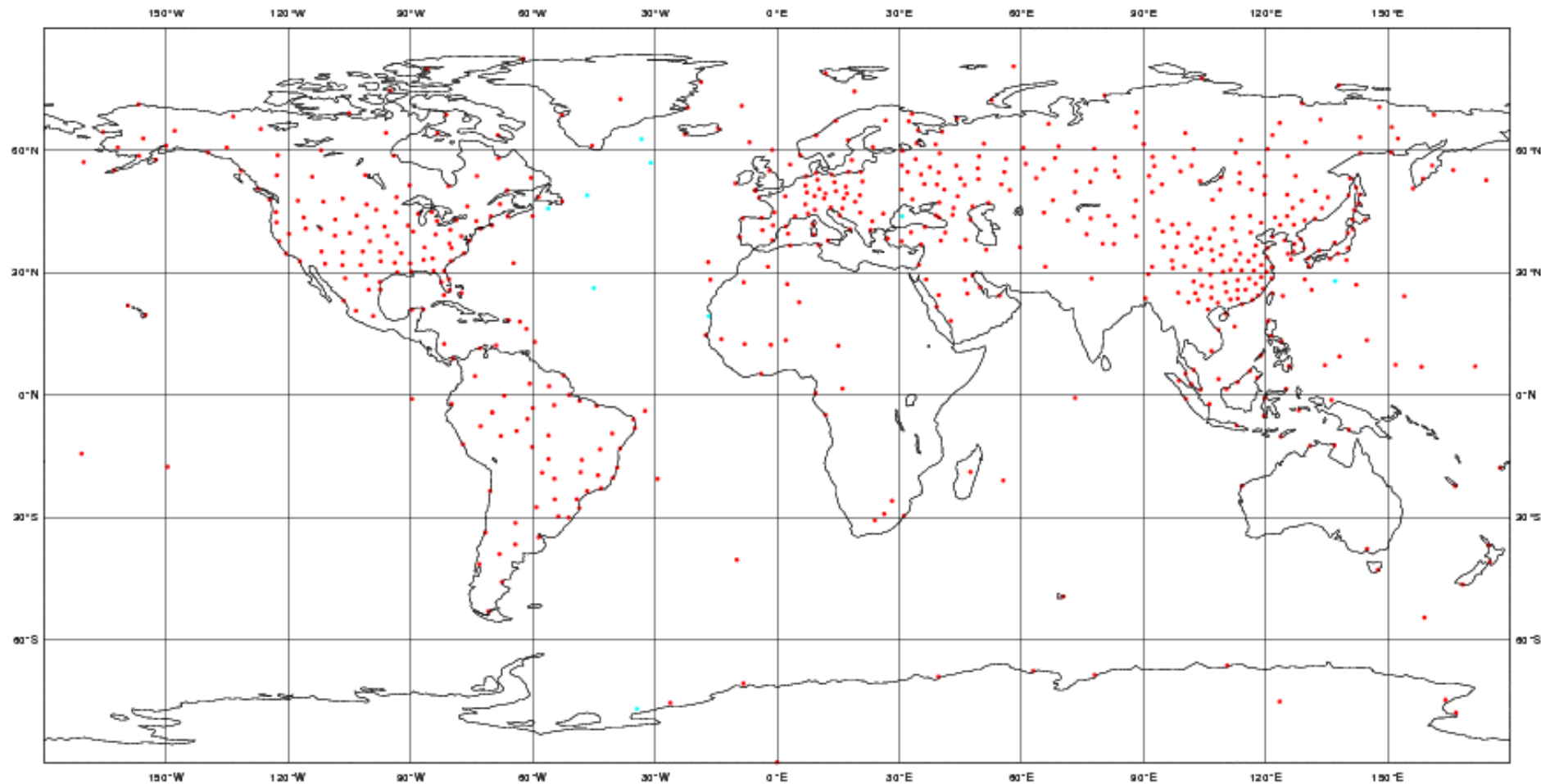


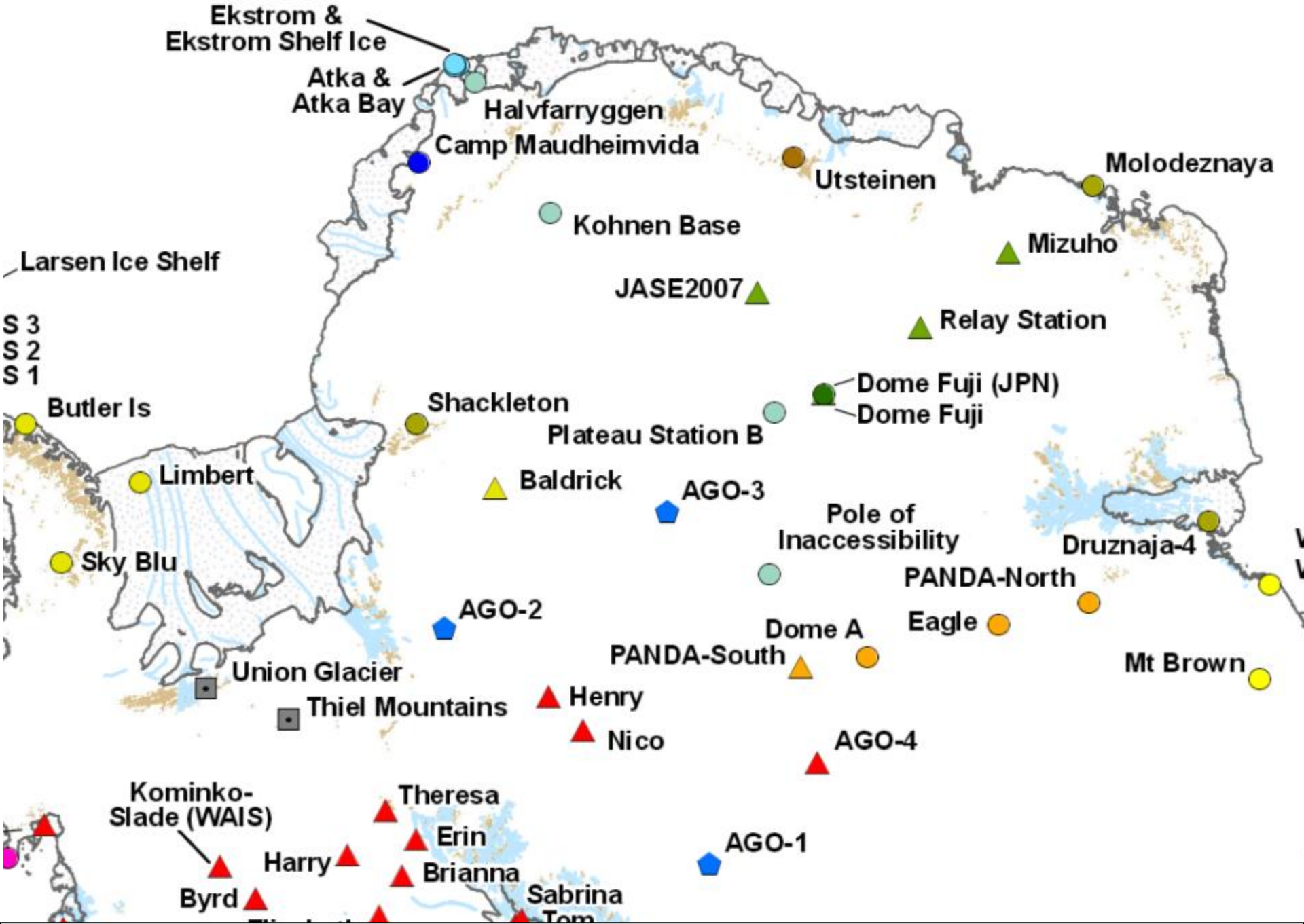
ECMWF Data Coverage (All obs DA) - Temp

12/Jan/2014; 12 UTC

Total number of obs = 600

- 9 SHIP
- 591 LAND
- MOBILE
- DROPSONDE



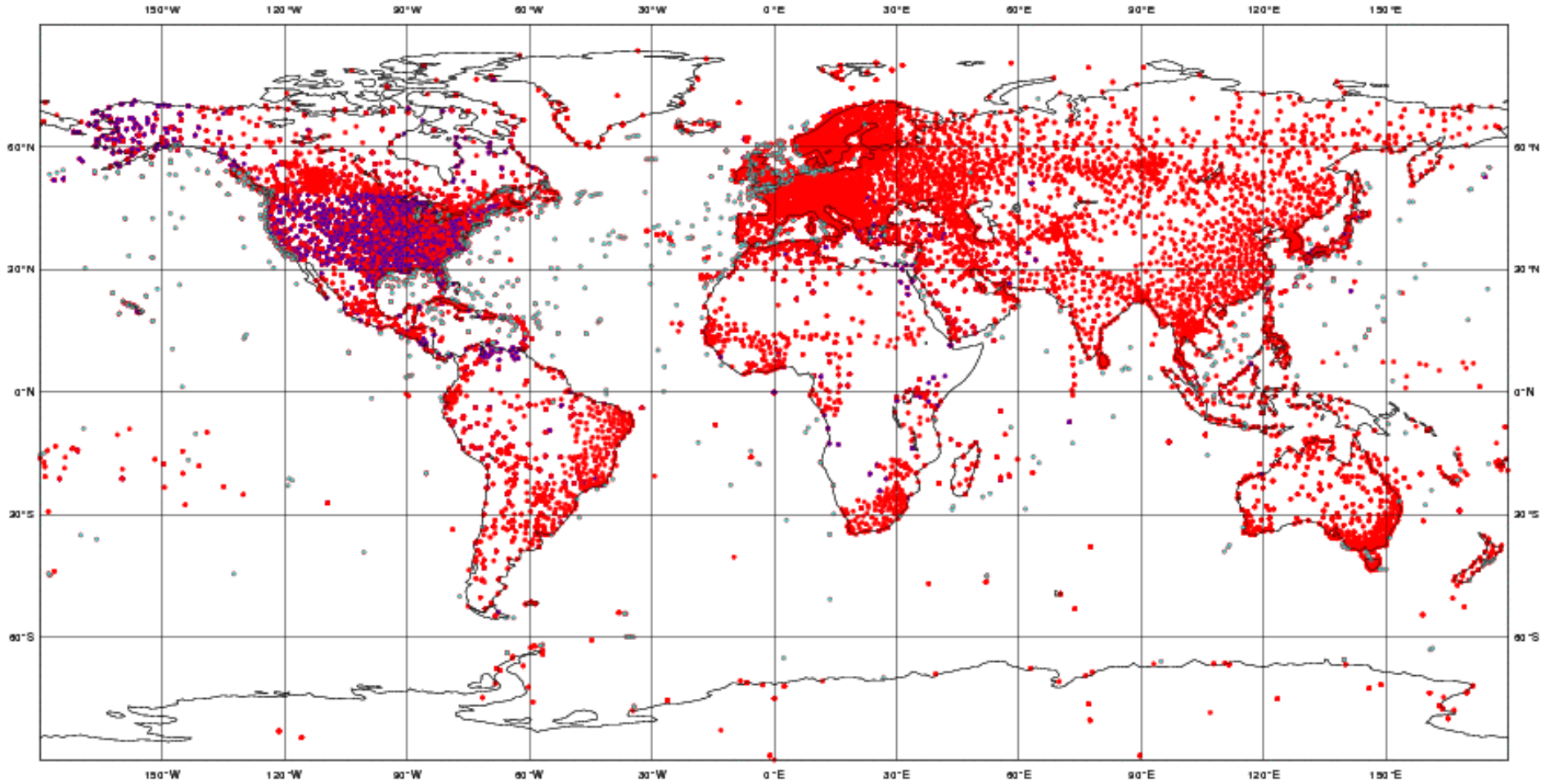


Source: http://uwamrc.ssec.wisc.edu/aws/documents/2013_AWS_Sites_ALL_07_11_2013

ECMWF Data Coverage (All obs DA) - Synop-Ship-Metar

12/Jan/2014; 12 UTC
Total number of obs = 70064

20879 SYNOP 2787 SHIP 48398 METAR







Temperature and Relative Humidity Probe

HMP155 (Vaisala)

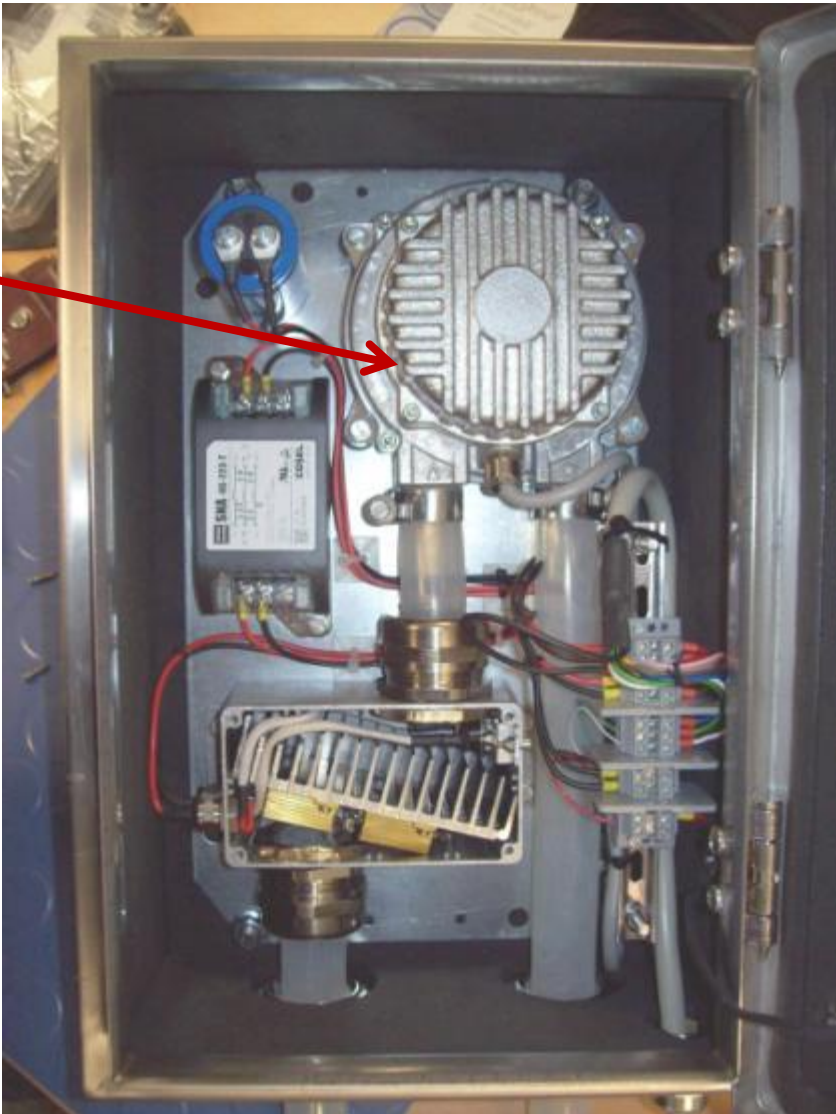
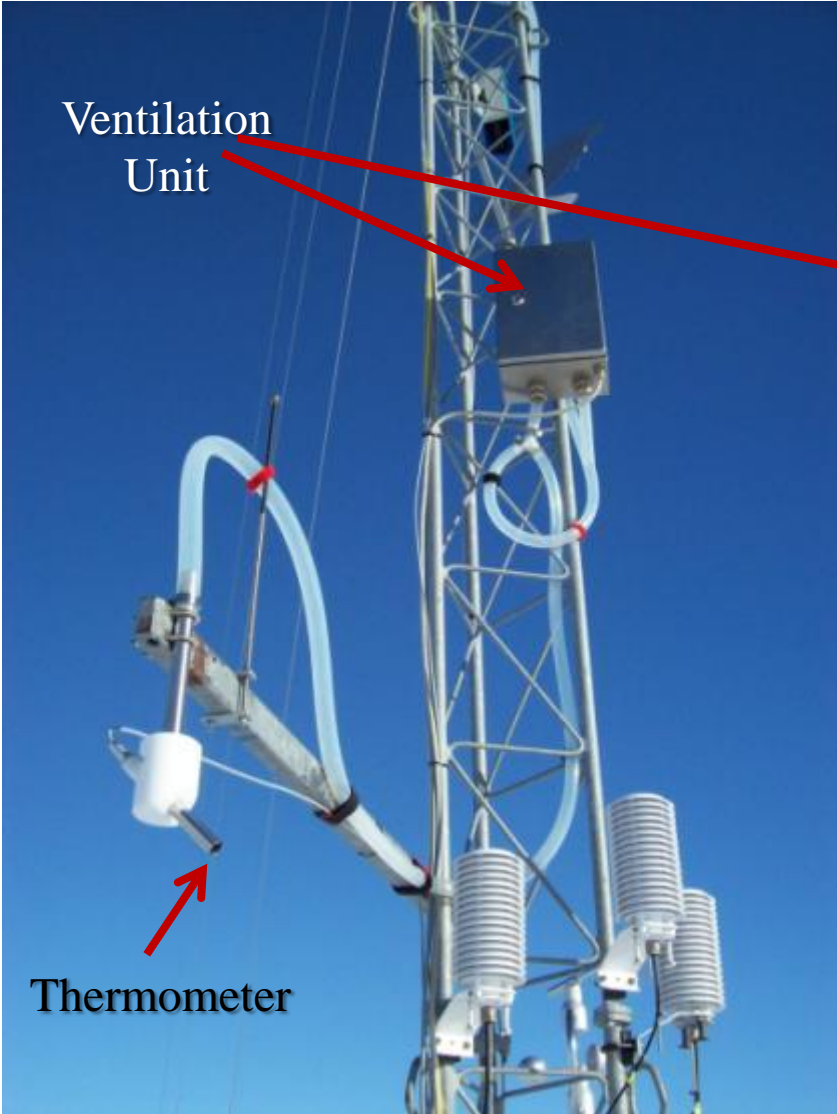
Successor of HMP45C

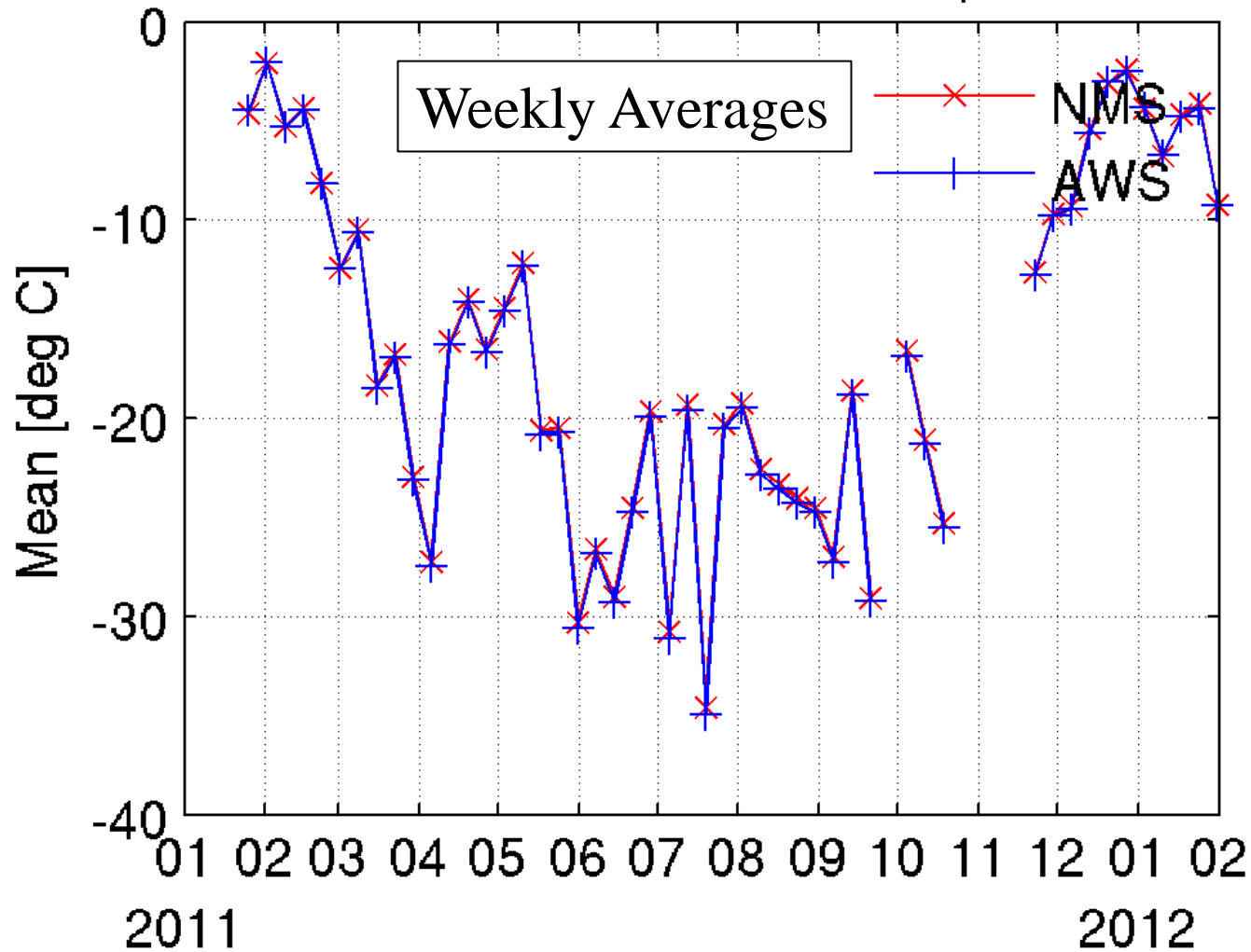
Pt100 4 - wire over half bridge 4WPB100 (Campbell Scientific)

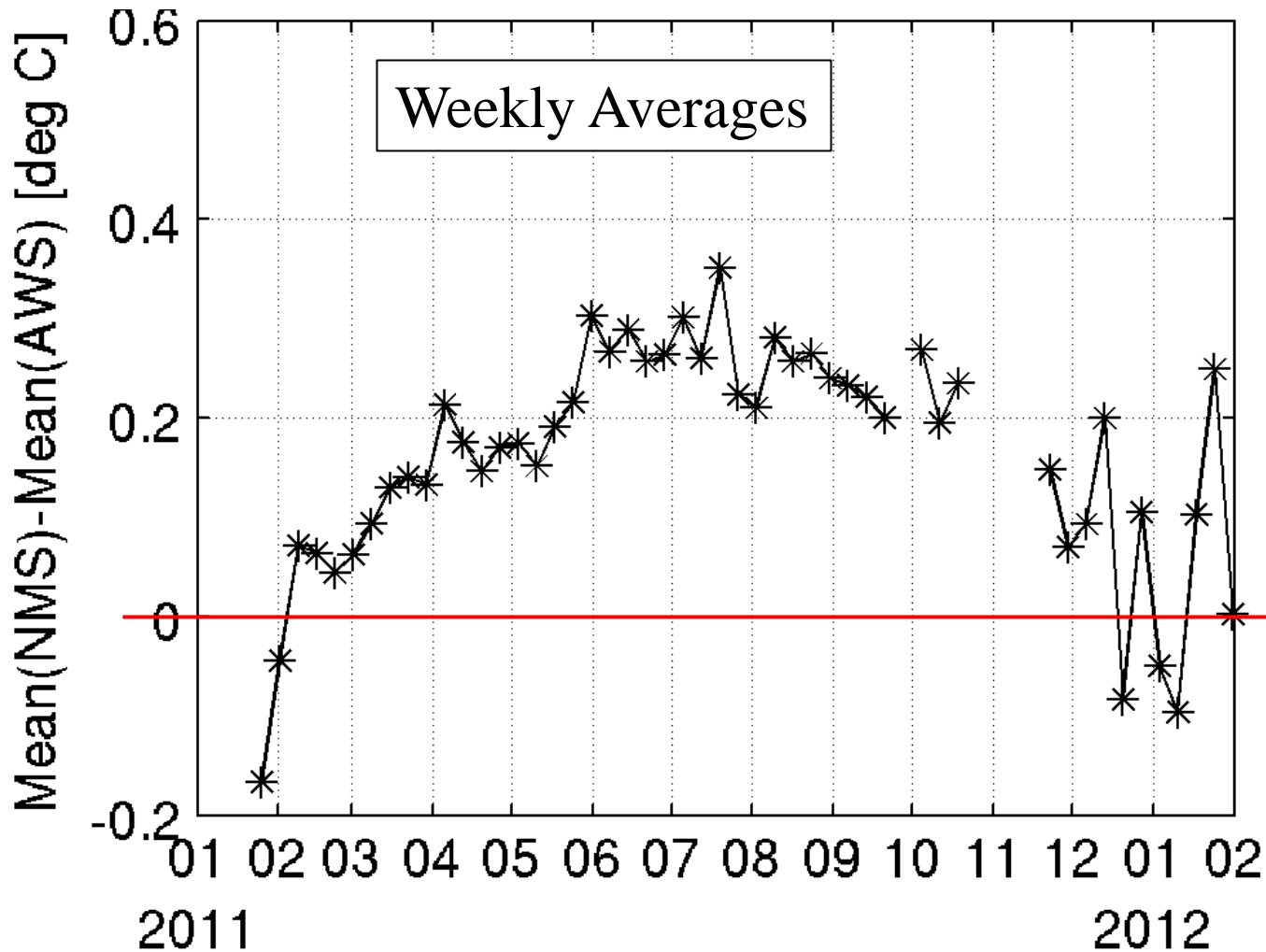
Radiation shield

MET21 un aspirated

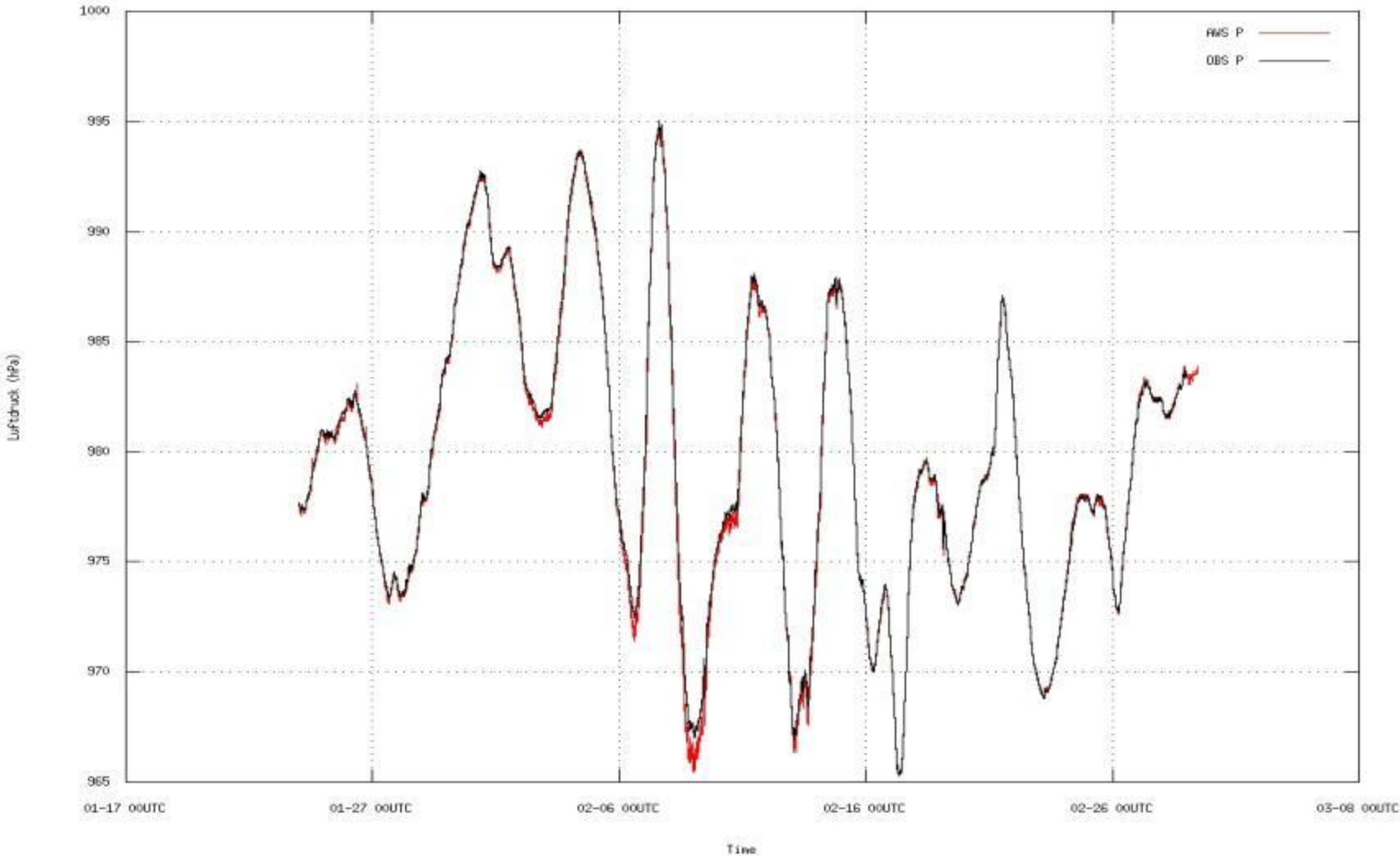




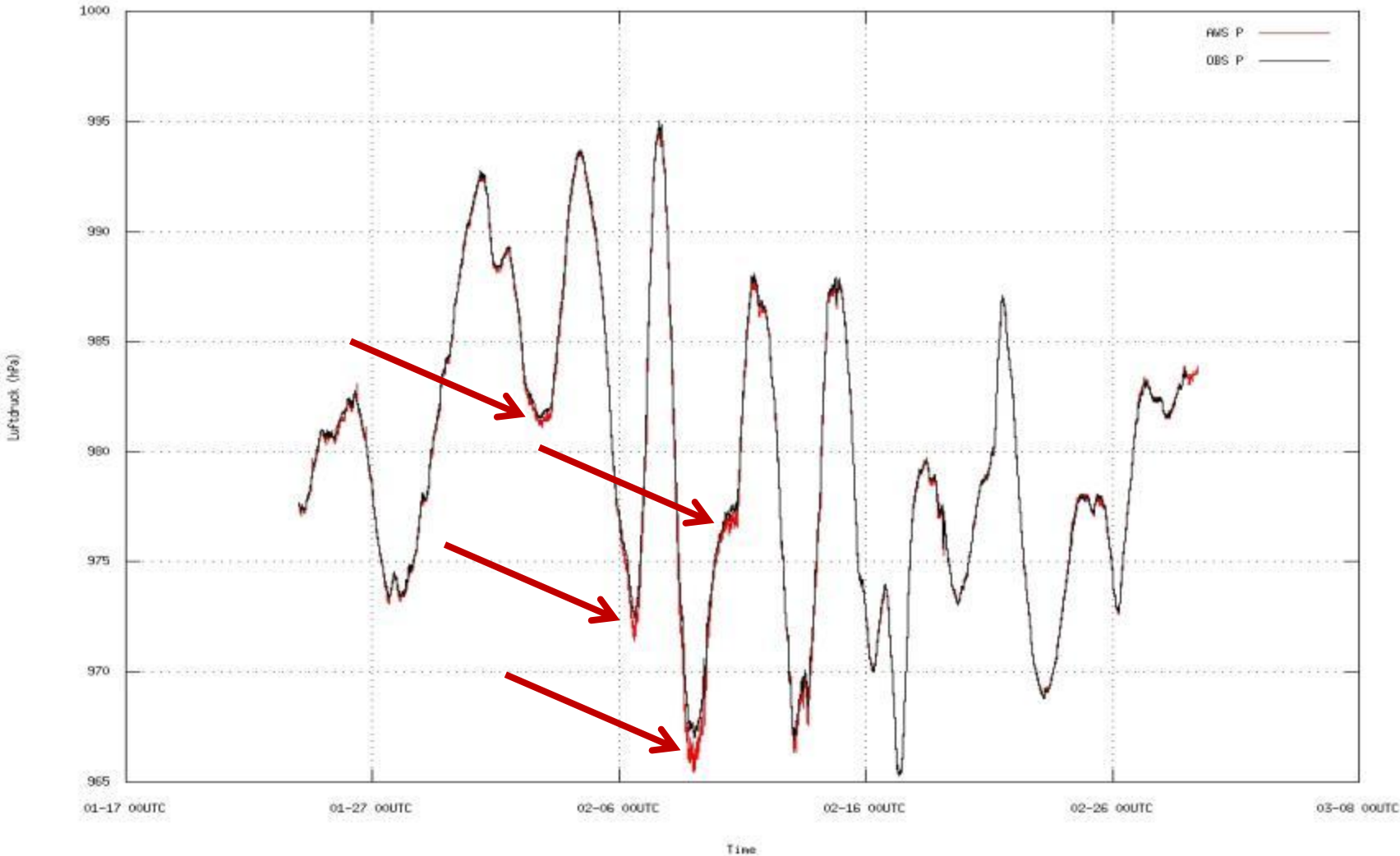




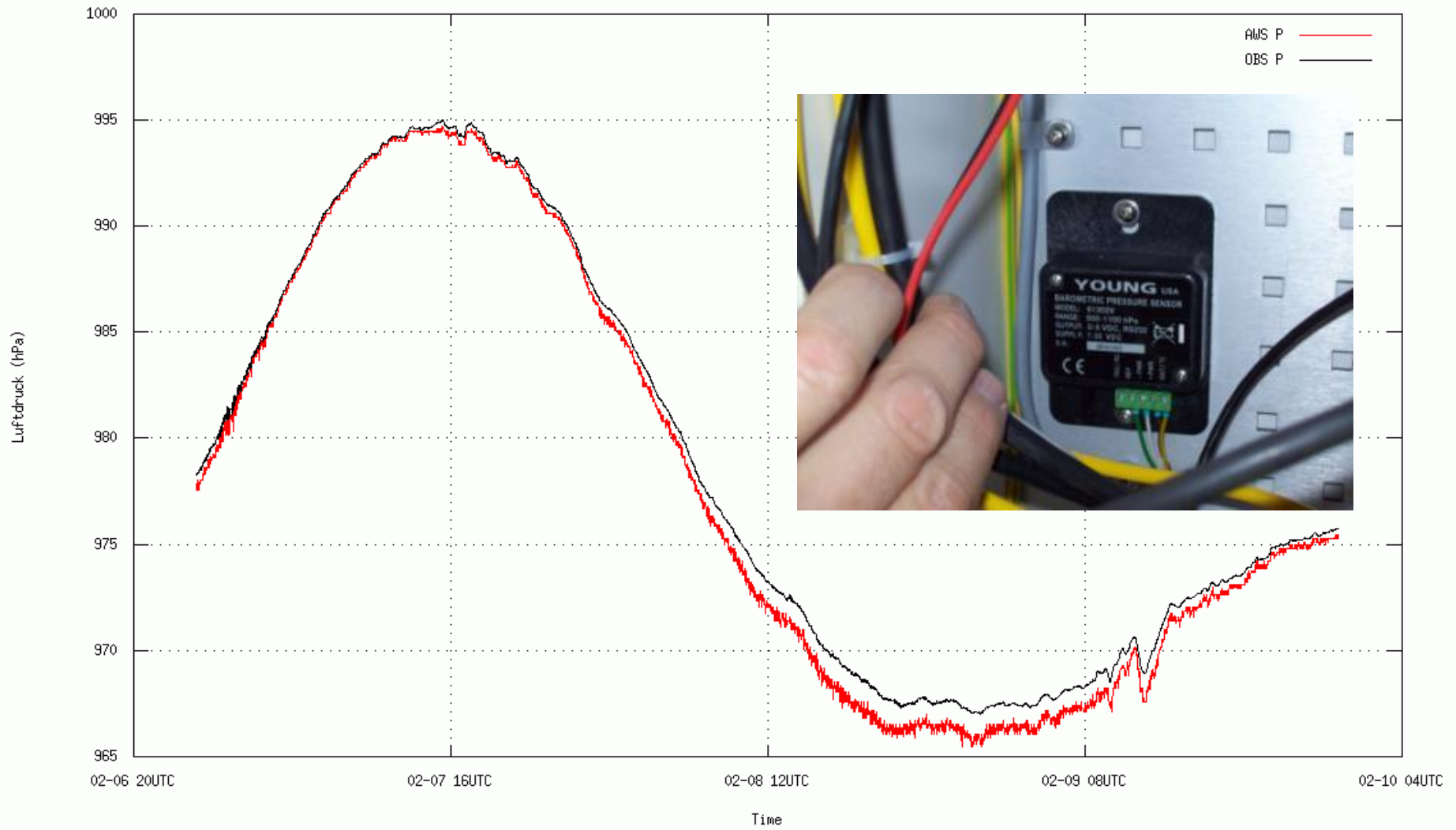
RMS versus Obs at Neunayer, 2011



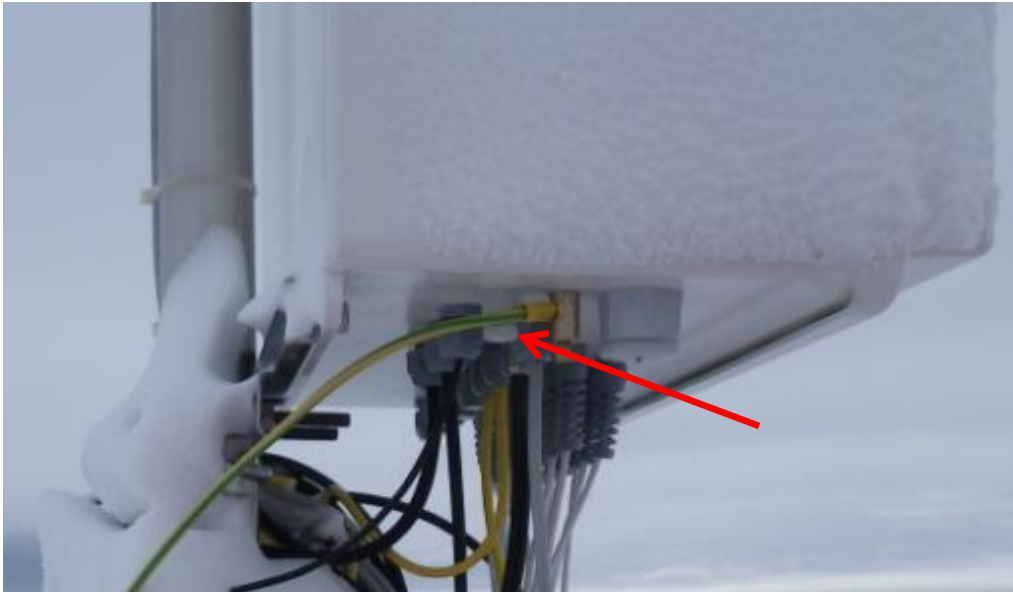
RMS versus Obs at Neunayer, 2011



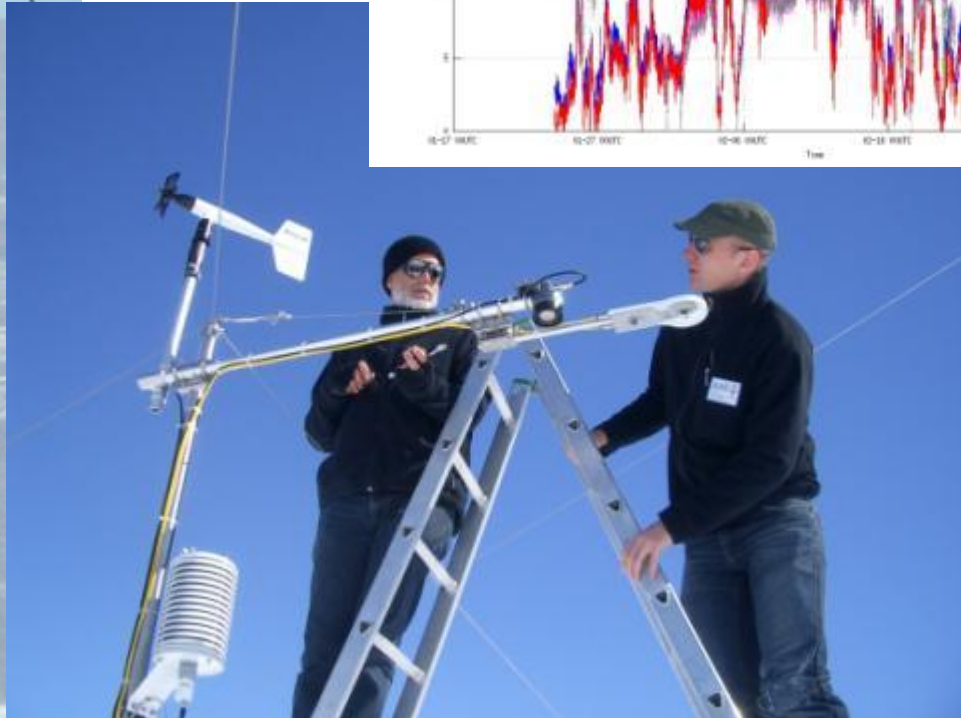
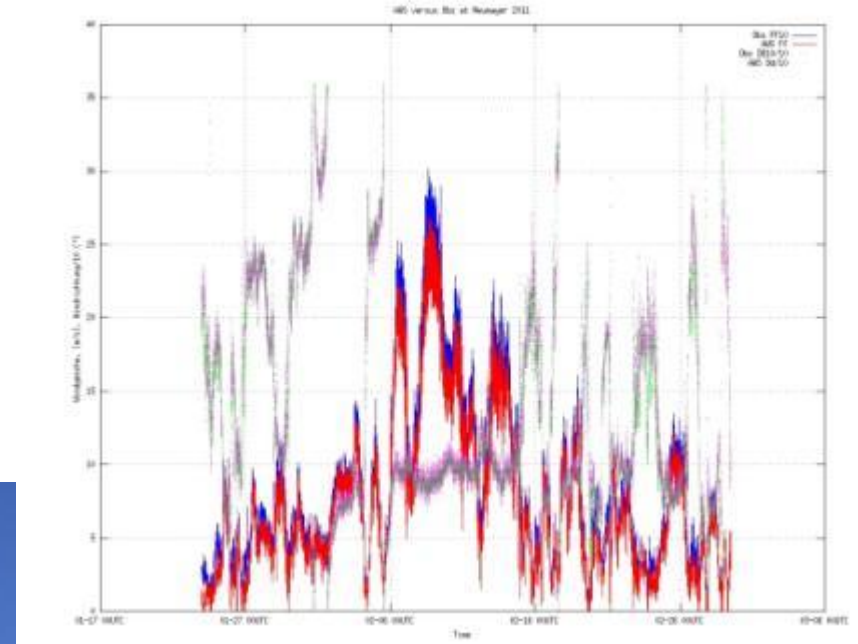
AWS versus Obs at Neumayer 2011



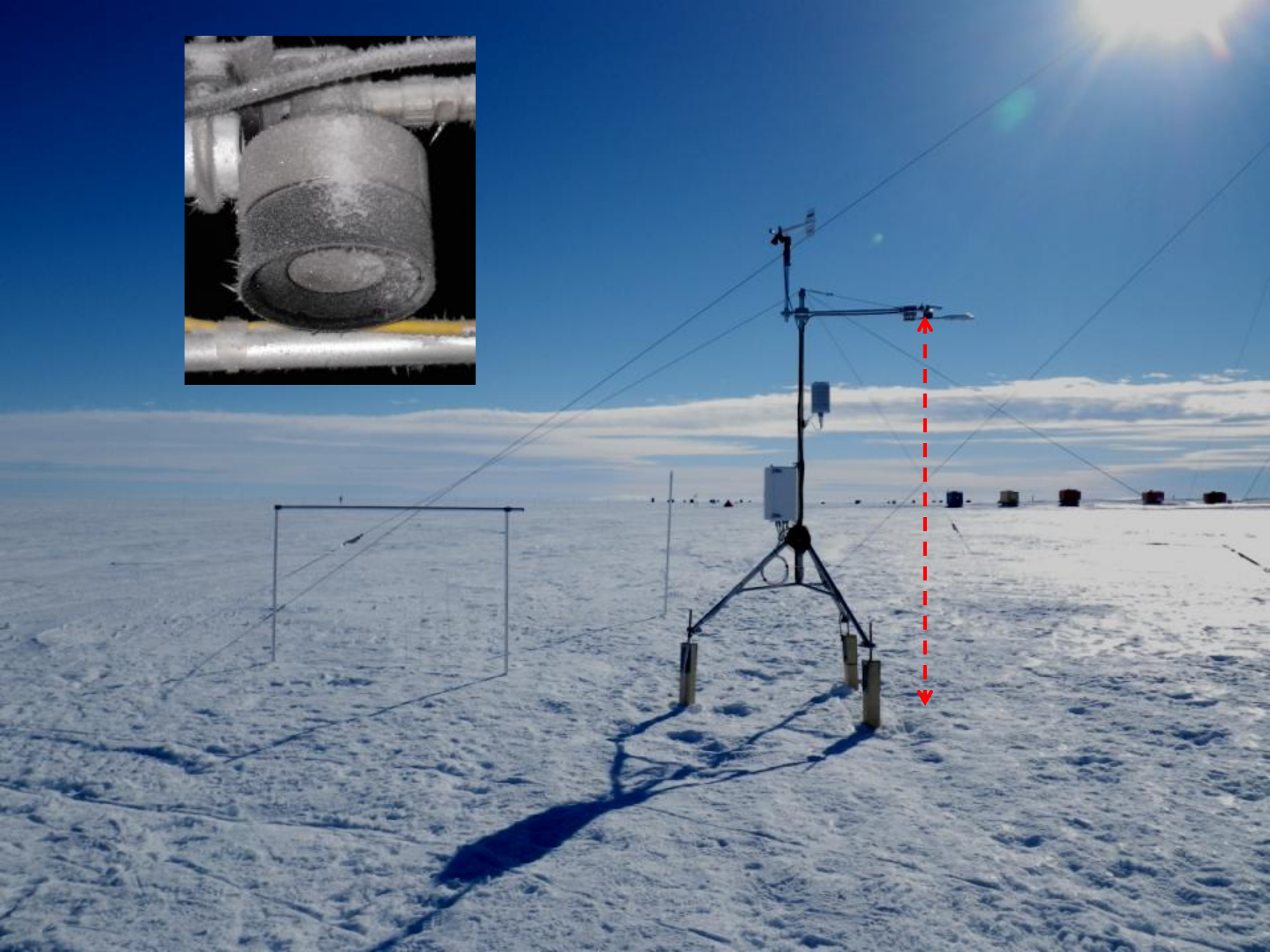
Air Pressure

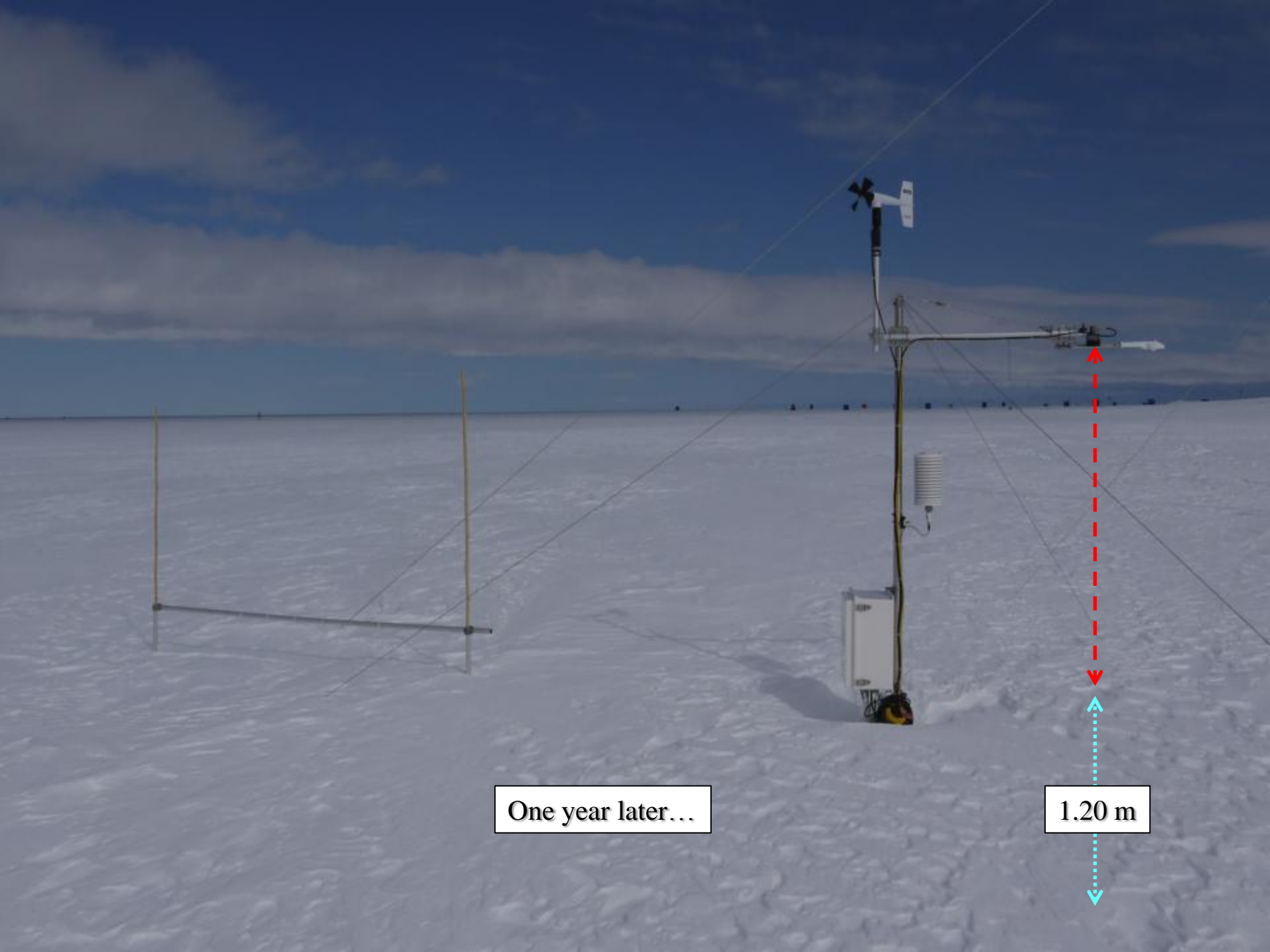


Wind Direction and Speed









One year later...

1.20 m

In Situ Data

Soundings

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Models

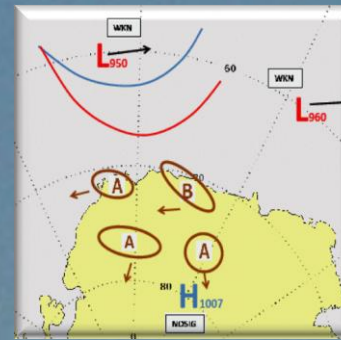
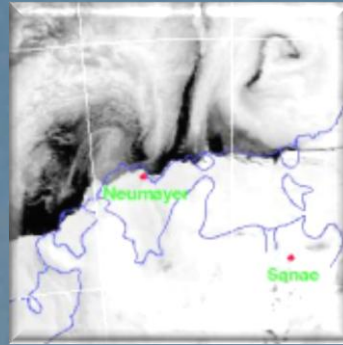
ECMWF

AMPS

GFS

Forecast Products

Verification & Outlook

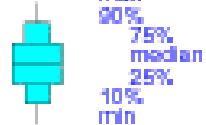
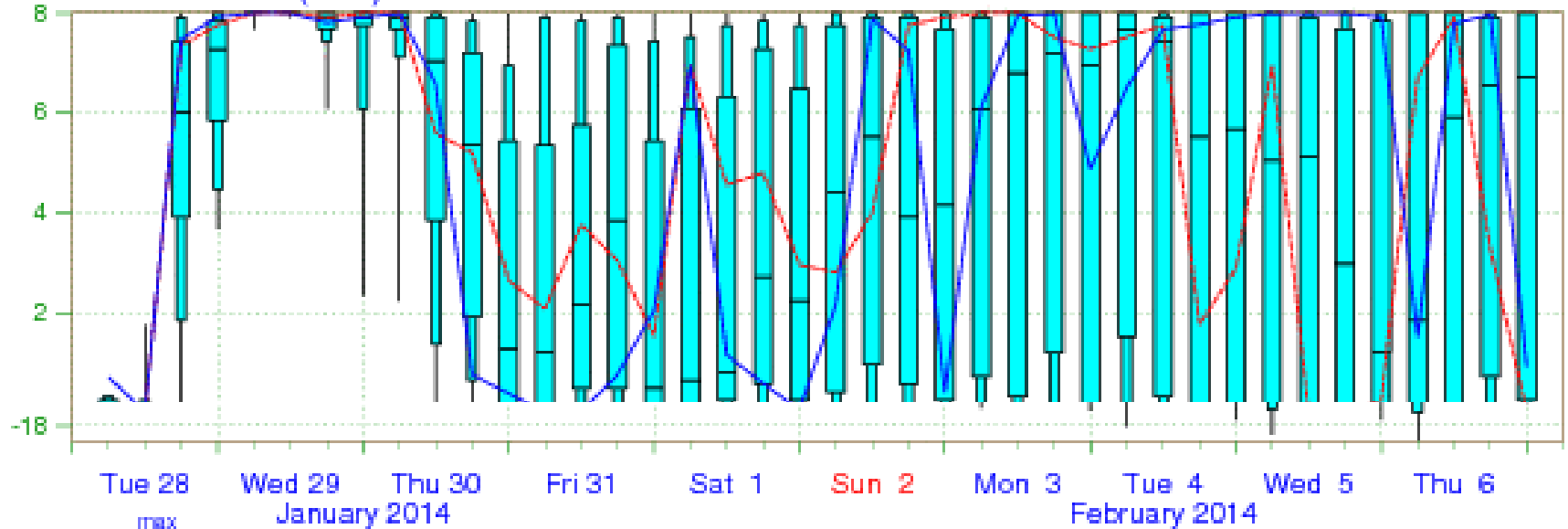


EPS Meteogram

Neumayer (SP) 70.68°S 8°W (EPS land point) -2 m (T1279)

Deterministic Forecast and EPS Distribution Tuesday 28 January 2014 00 UTC

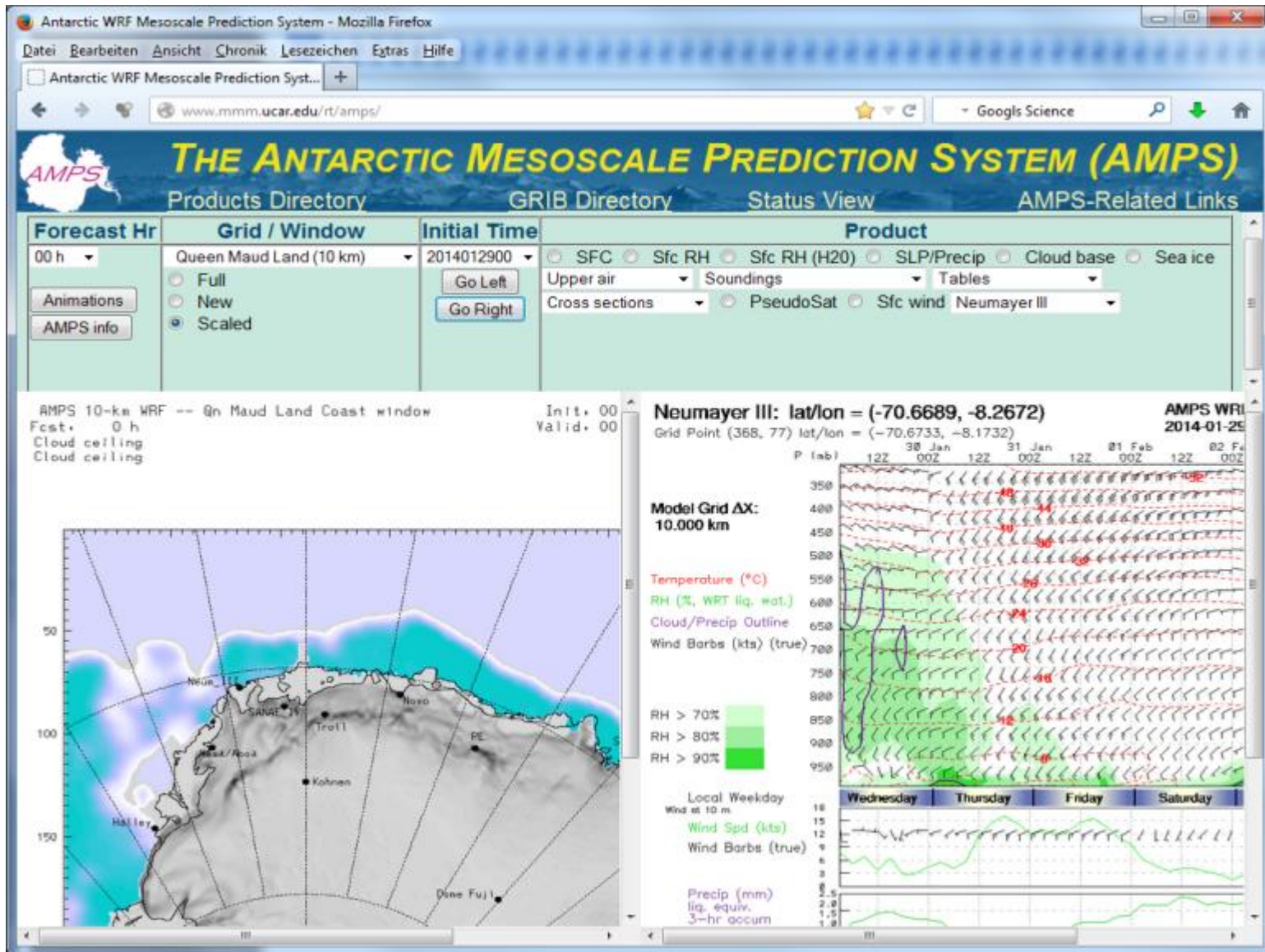
Total Cloud Cover (okta)

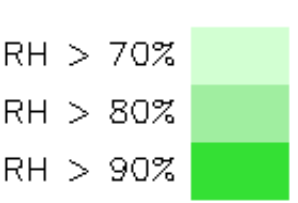


EPS Control(31 km) High Resolution Deterministic(16 km)

Magks++ 2.0.6

ECMWF





Local Weekday
Wind at 10 m

Wind Spd (kts)

Wind Barbs (true)

Precip (mm)

liq. equiv.

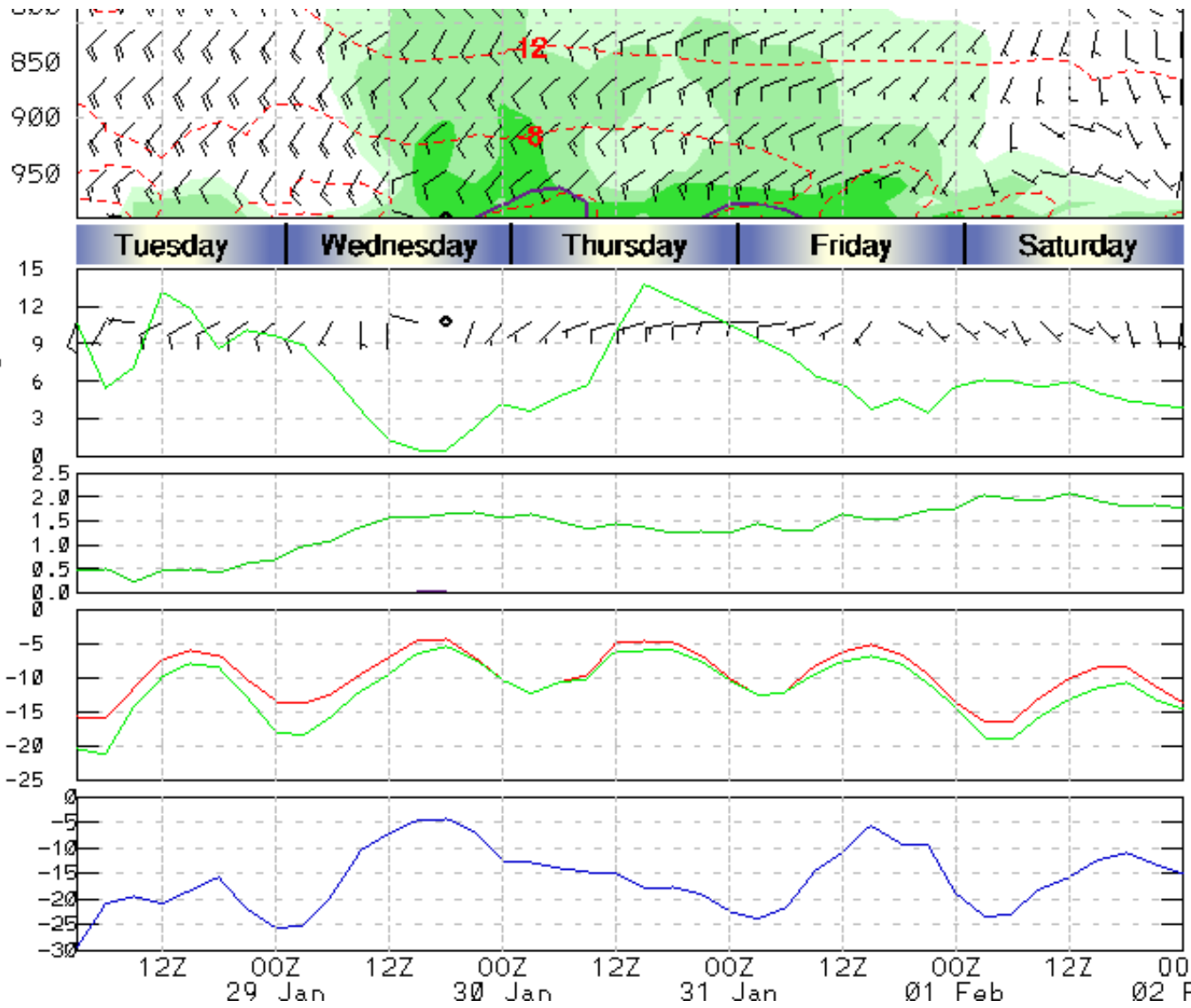
3-hr accum

Pressure (mb)

Temperature (°C)

Dewpoint (°C)

Wind Chill T (°C)

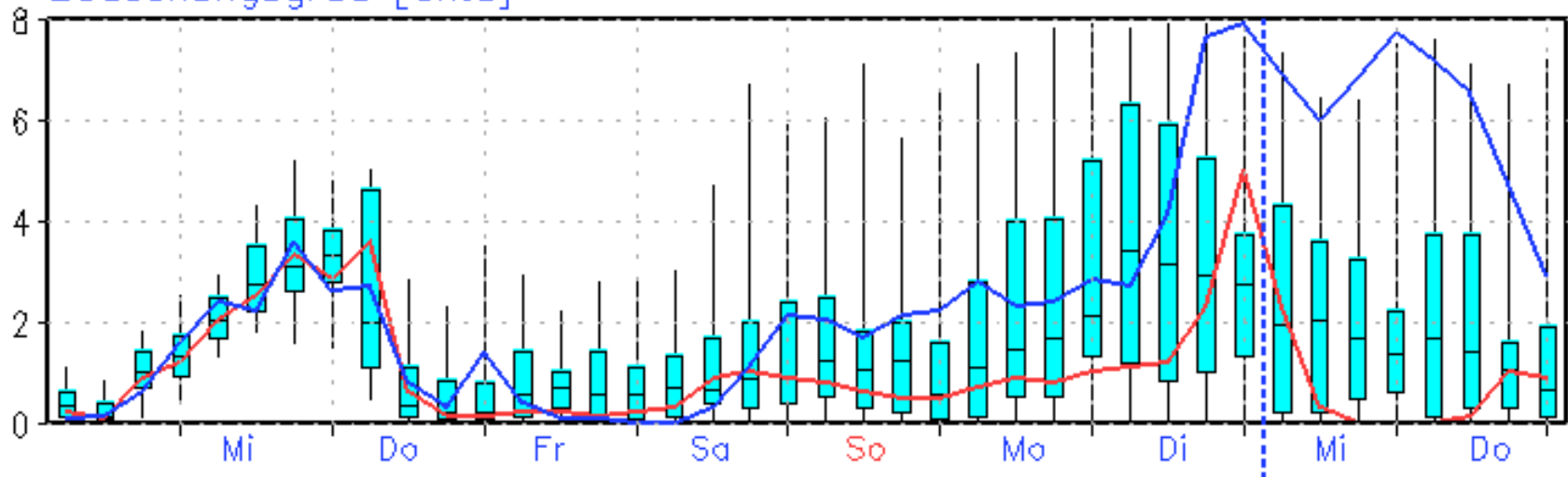


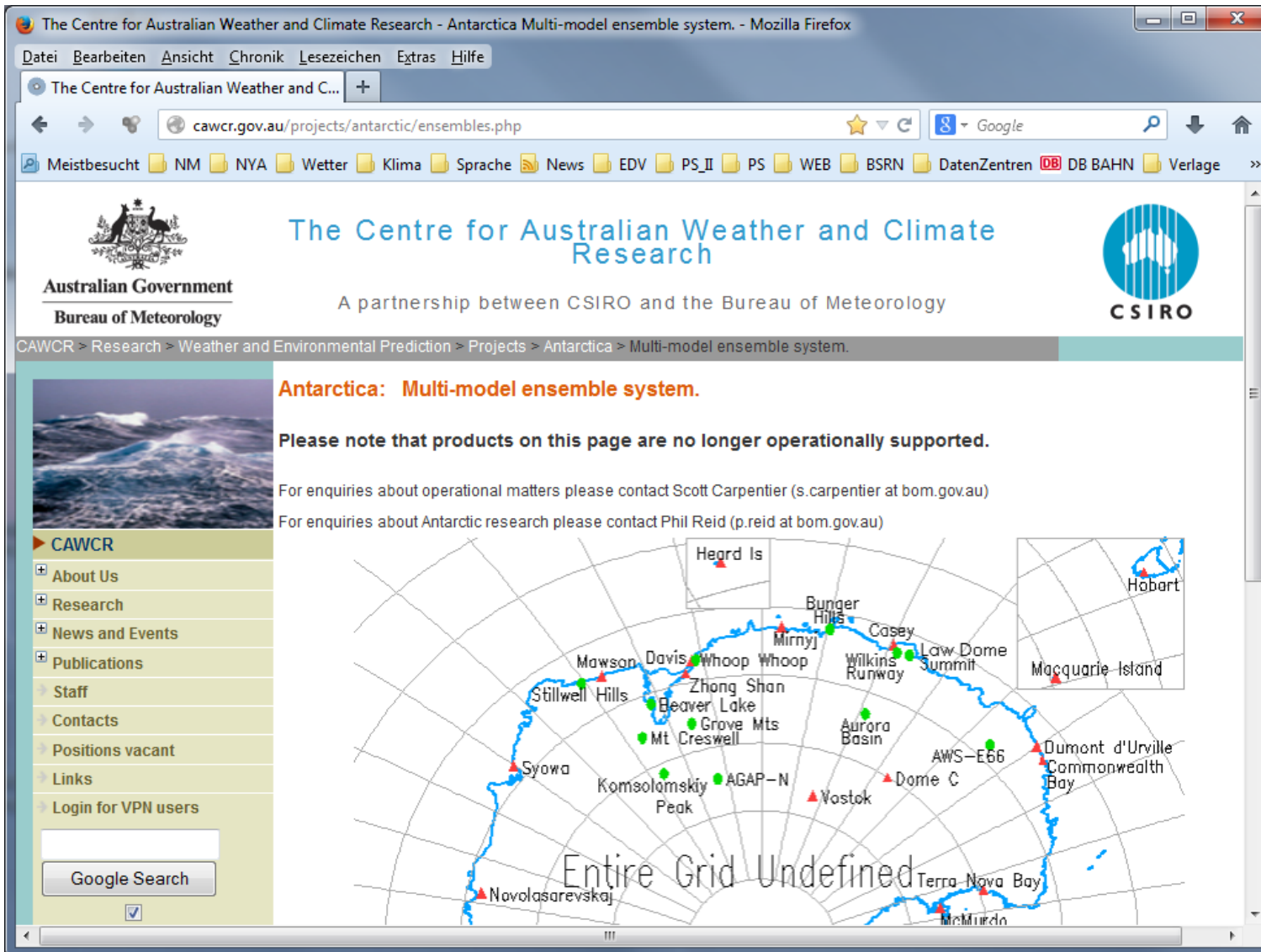
5.0
2.5
0.13

992
990
988
986
984
982 (mb)

GFS-Ensemble-Meteogramm
vom Dienstag, den 28.01.2014 [00 UTC]
für Gitterpunkt -71°N -8°O : "Neumayer 25m"

Bedeckungsgrad [okta]







The Centre for Australian Weather and Climate Research - Antarctica Multi-model ensemble system. - Mozilla Firefox

File Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

cawcr.gov.au/projects/antarctic/ensembles.php

Meistbesucht NM NYA Wetter Klima Sprache News EDV PS_II PS WEB BSRN DatenZentren DB BAHN Verlage

 **The Centre for Australian Weather and Climate Research** 

Australian Government
Bureau of Meteorology

A partnership between CSIRO and the Bureau of Meteorology

CAWCR > Research > Weather and Environmental Prediction > Projects > Antarctica > Multi-model ensemble system.

Antarctica: Multi-model ensemble system.

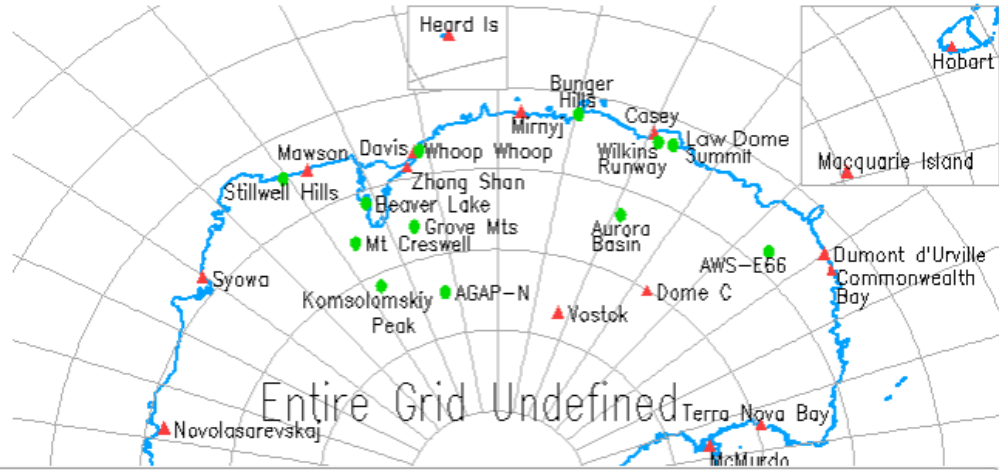
Please note that products on this page are no longer operationally supported.

For enquiries about operational matters please contact Scott Carpentier (s.carpentier at bom.gov.au)
For enquiries about Antarctic research please contact Phil Reid (p.reid at bom.gov.au)

CAWCR

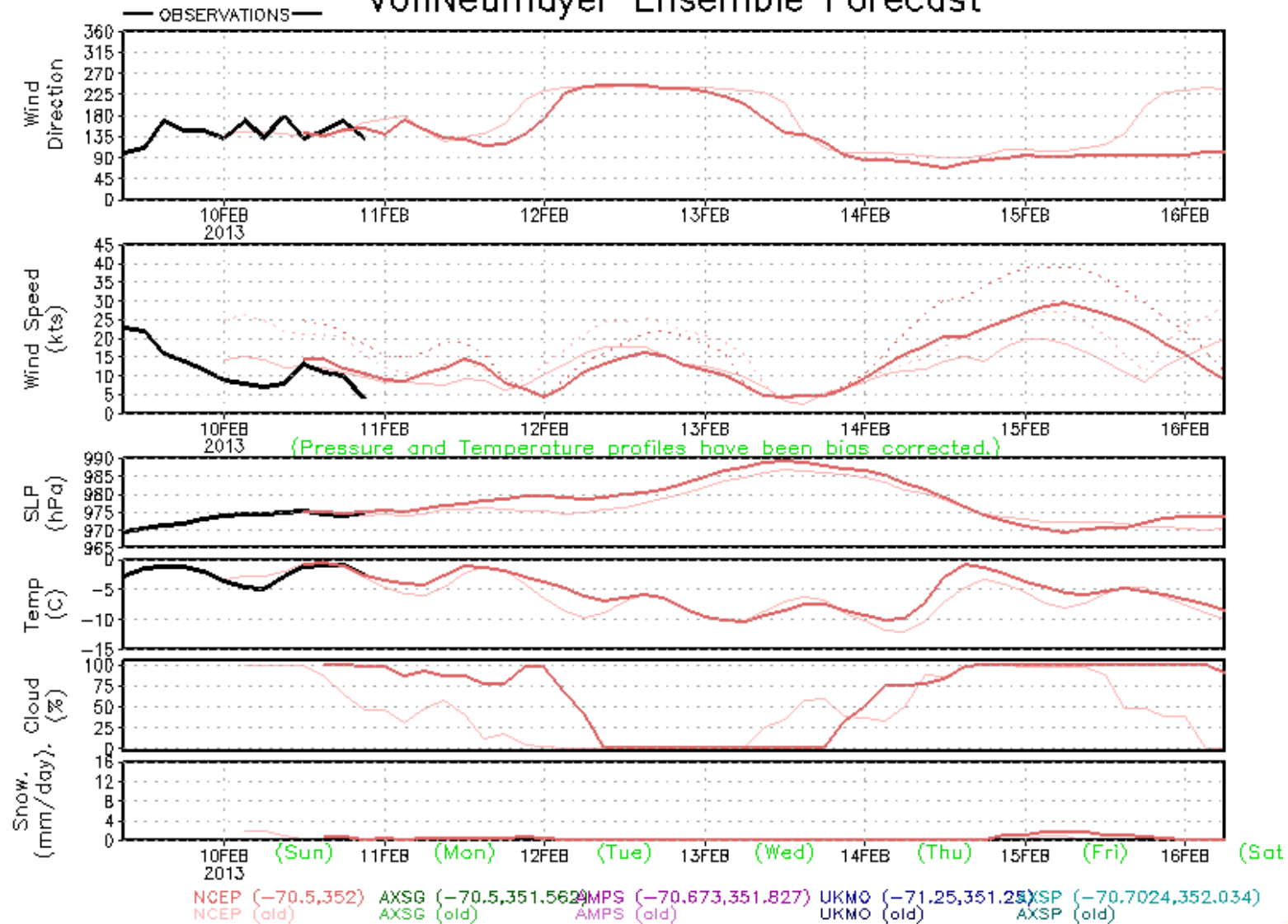
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Entire Grid Undefined

VonNeumayer Ensemble Forecast



In Situ Data

Soundings

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ECMWF

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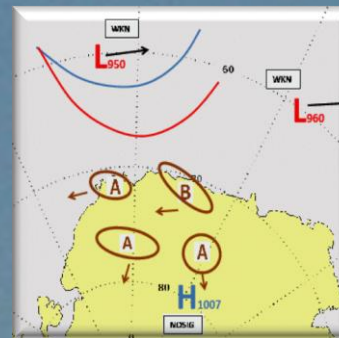
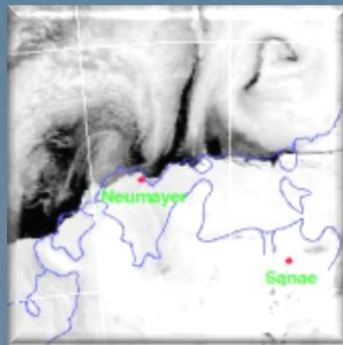
General

Chart

Aerodrome

Aviation

Verification & Outlook



Summer Forecast Service via WEB:

http://www.awi.de/en/infrastructure/stations/neumayer_station/dromlan_service/

Overview Infrastructure

[Infrastructure](#)

Overview Stations

[Stations](#)

Overview Neumayer Station

[Neumayer Station](#)

Meteorological Information from Neumayer

[DROMLAN-Service](#)

Forecast Products

[General \(Text\)](#)

[Chart \(Map\)](#)

[Aerodrome \(Table\)](#)

[Aviation \(Text\)](#)

[Real Time Data from Neumayer](#)

[Landing Conditions at Neumayer](#)

[Information from other Stations](#)

[Home](#) > [Infrastructure](#) > [Stations](#) > [Neumayer Station](#) > [DROMLAN-Service](#) > [Forecast Products](#) > [Chart \(Map\)](#)



Click on diagram to download and enlarge. Downloaded document includes the legend.

DROMLAN Weather Chart (DWC)

issued by weather forecasting service at station Neumayer III

DWD

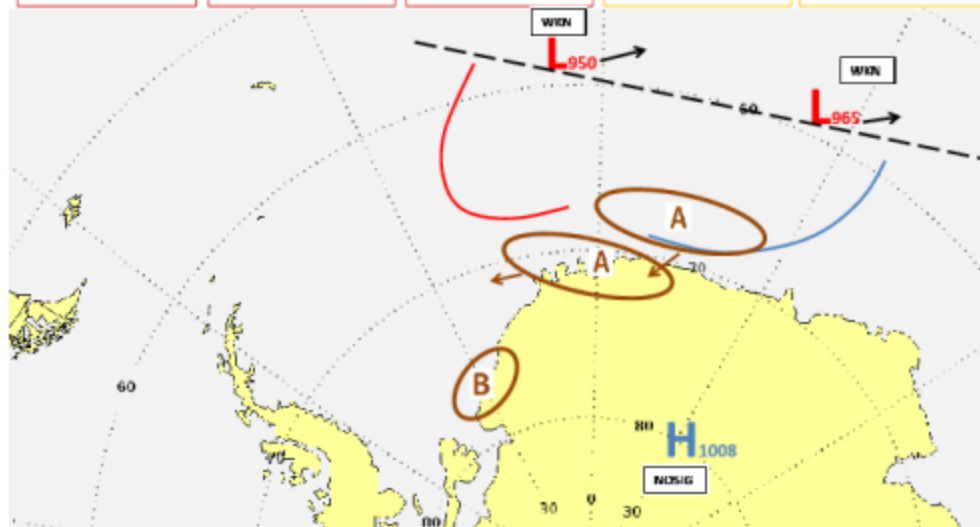
issued for SFC – FL100

no ICAO-area

VALID: 12 UTC 14.01.14 including trend of development for next 24h



A OVC HP CP CN	B  OVC HN CN	C	I	II
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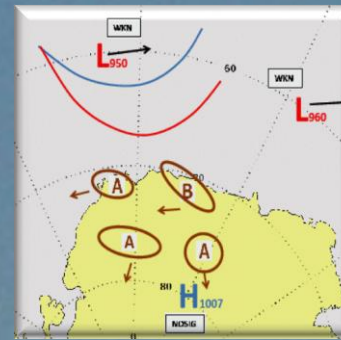
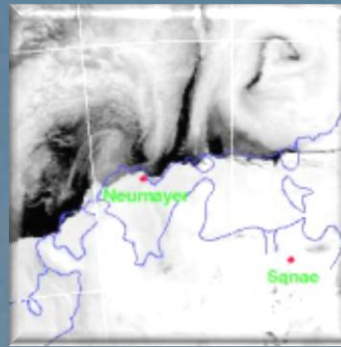
Aviation

Verification & Outlook

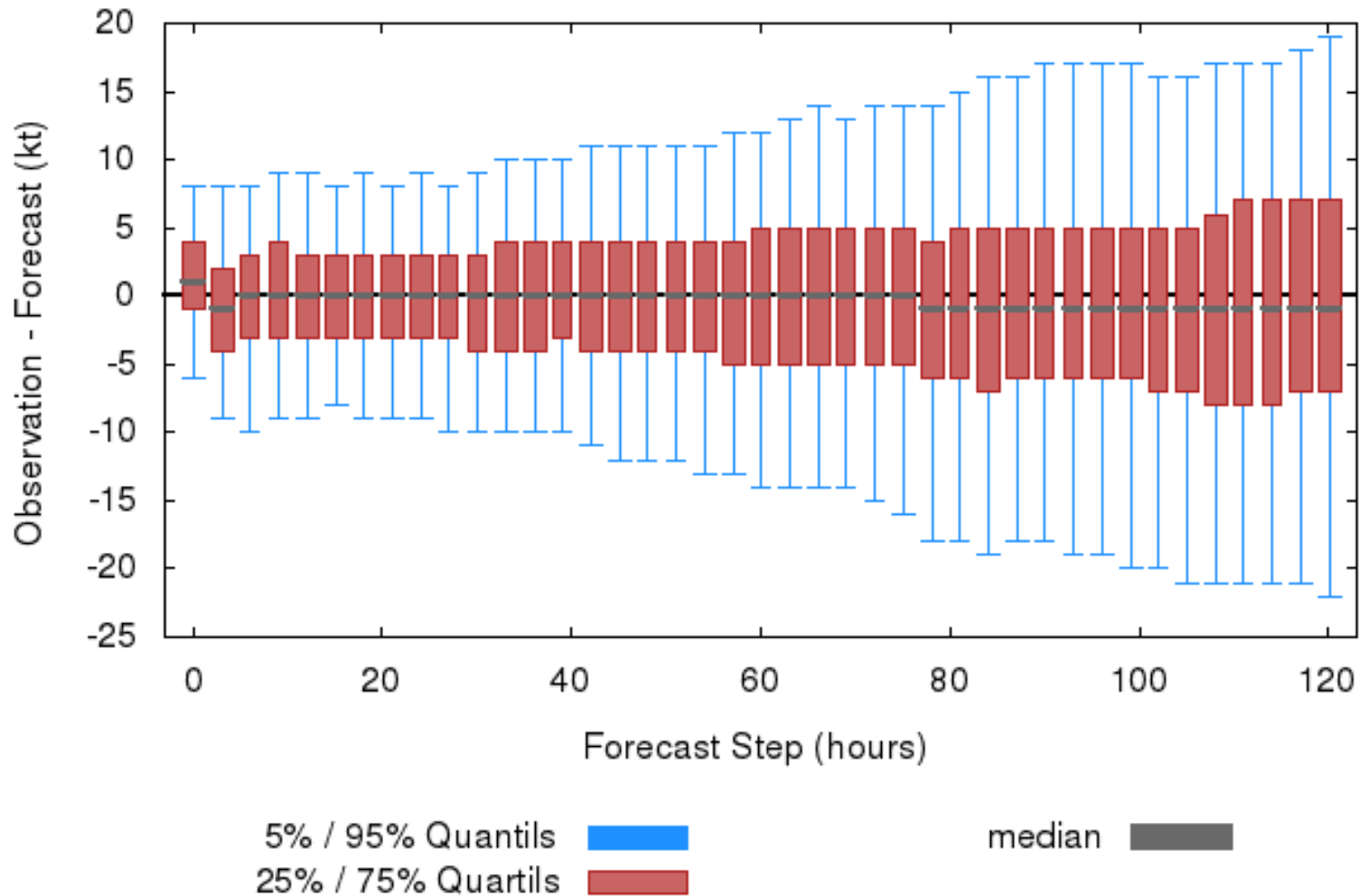
AMPS

ERA-Interim

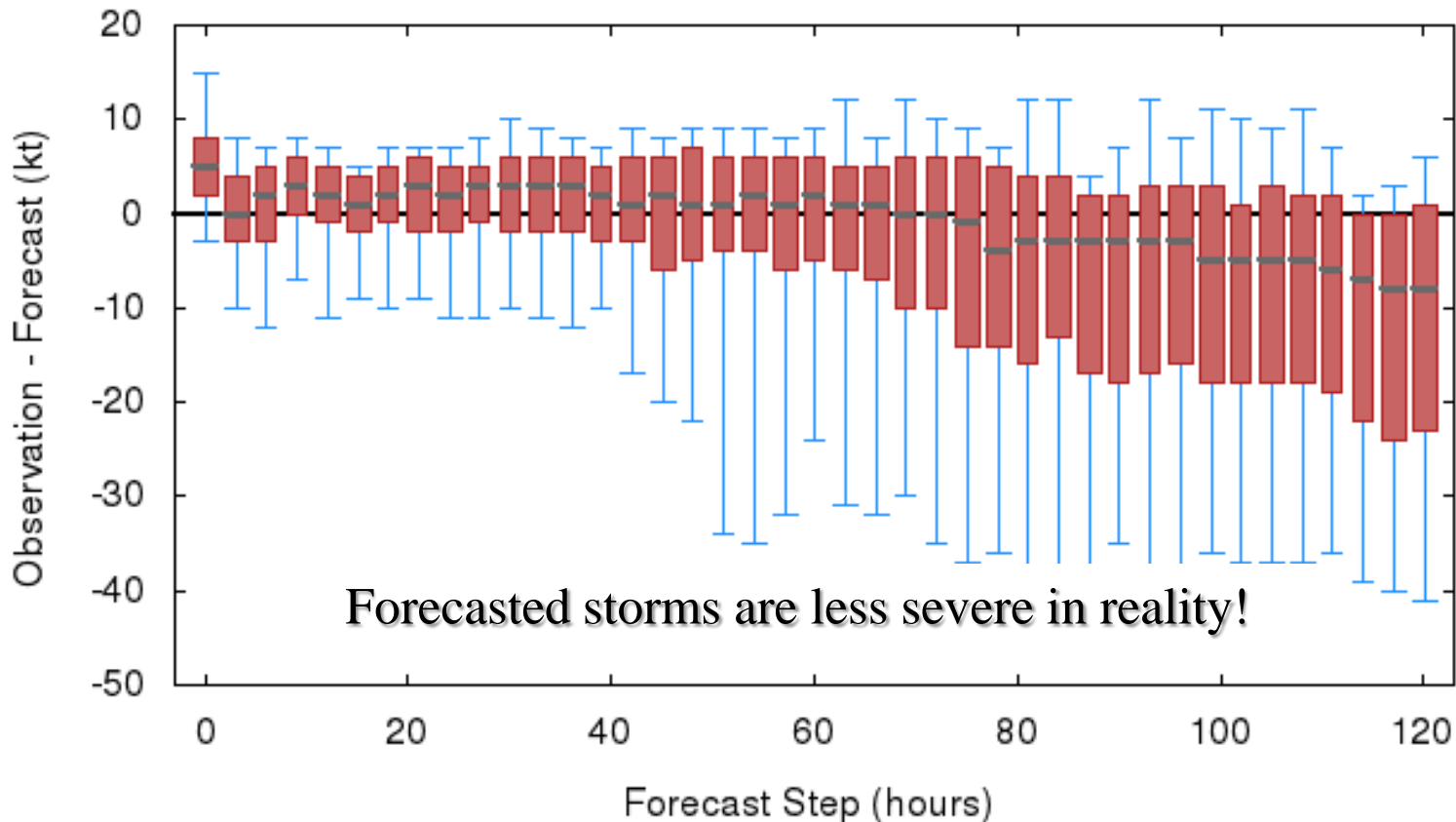
West Antarctica?





AMPS Forecast Validation Neumayer-Station
Data: 2010-2012 Run: 00UTC Parameter: Windspeed



AMPS Forecast Validation Neumayer-Station
Data: 2010-2012 Run: 00UTC Parameter: Windspeed (fcst > 30kt)

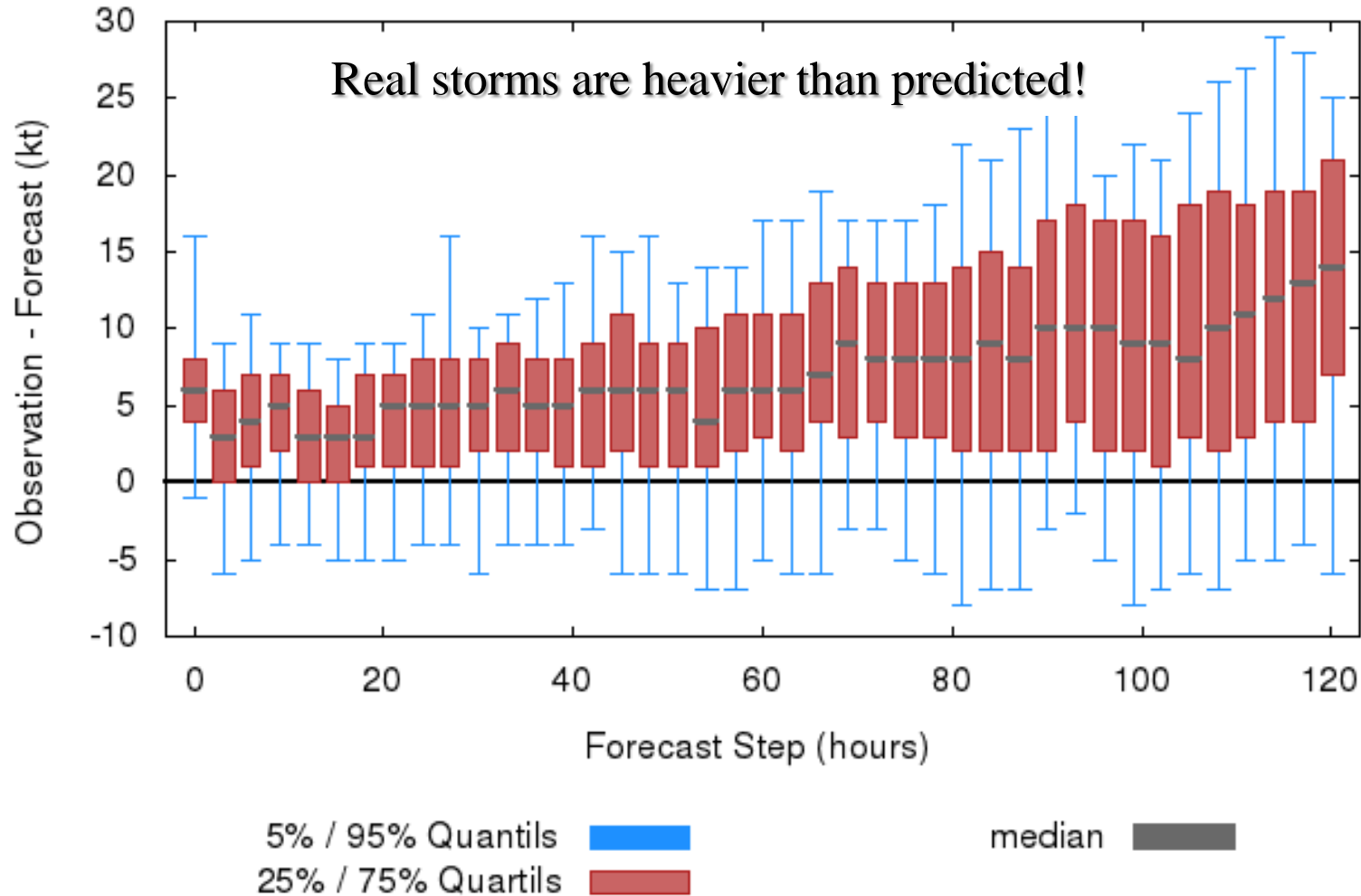


Forecasted storms are less severe in reality!

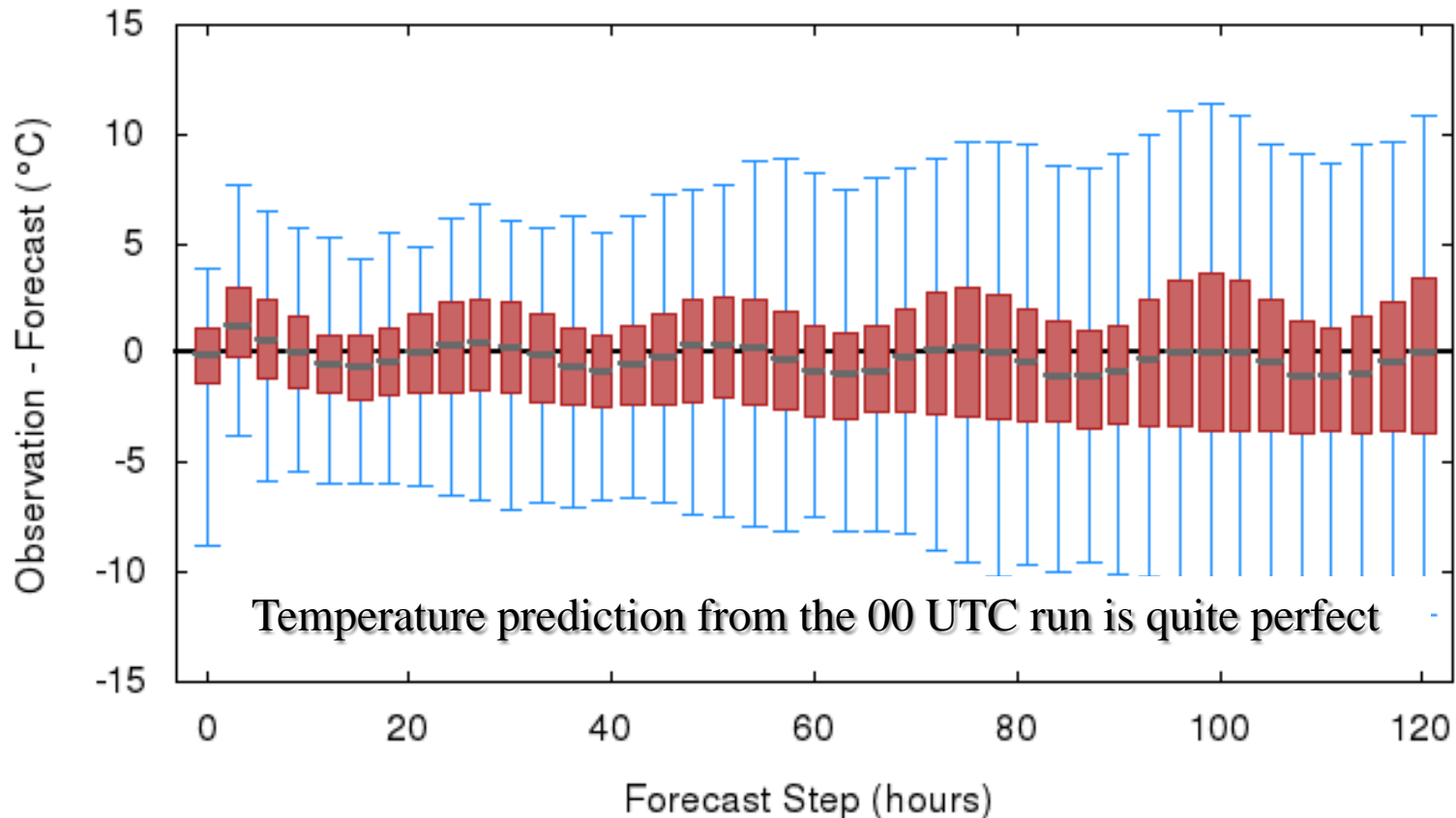
5% / 95% Quantils 
25% / 75% Quartils 



median 


AMPS Forecast Validation Neumayer-Station
Data: 2010-2012 Run: 00UTC Parameter: Windspeed (obs > 30kt)



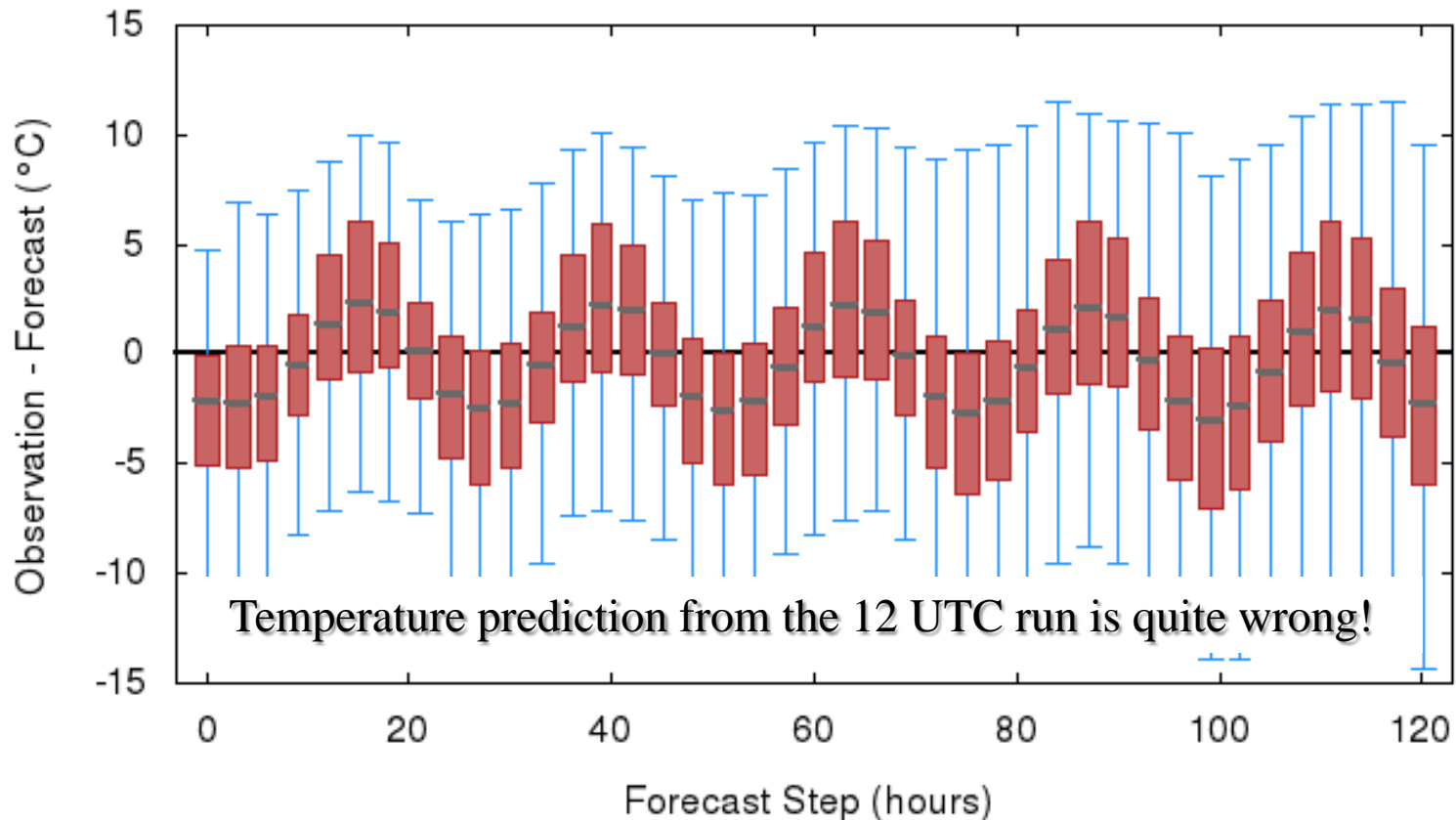
AMPS Forecast Validation Neumayer-Station
Data: 2010-2012 Run: 00UTC Parameter: Temperature





5% / 95% Quantils 
25% / 75% Quartils 

median 

AMPS Forecast Validation Neumayer-Station
Data: 2010-2012 Run: 12UTC Parameter: Temperature



5% / 95% Quantils 
25% / 75% Quartils 

median 

Temperature Trend

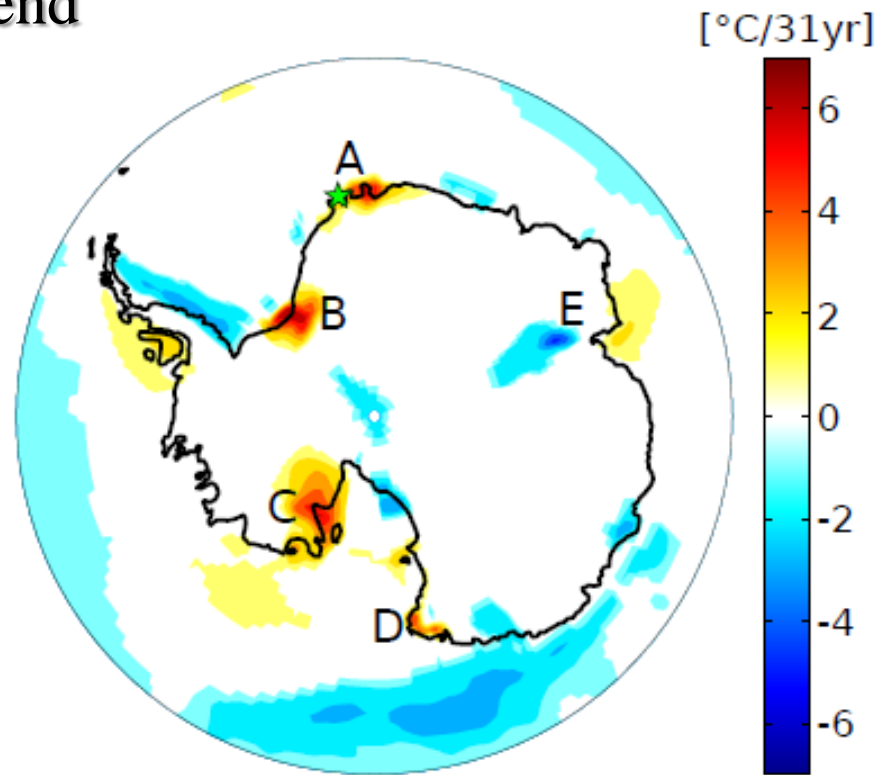
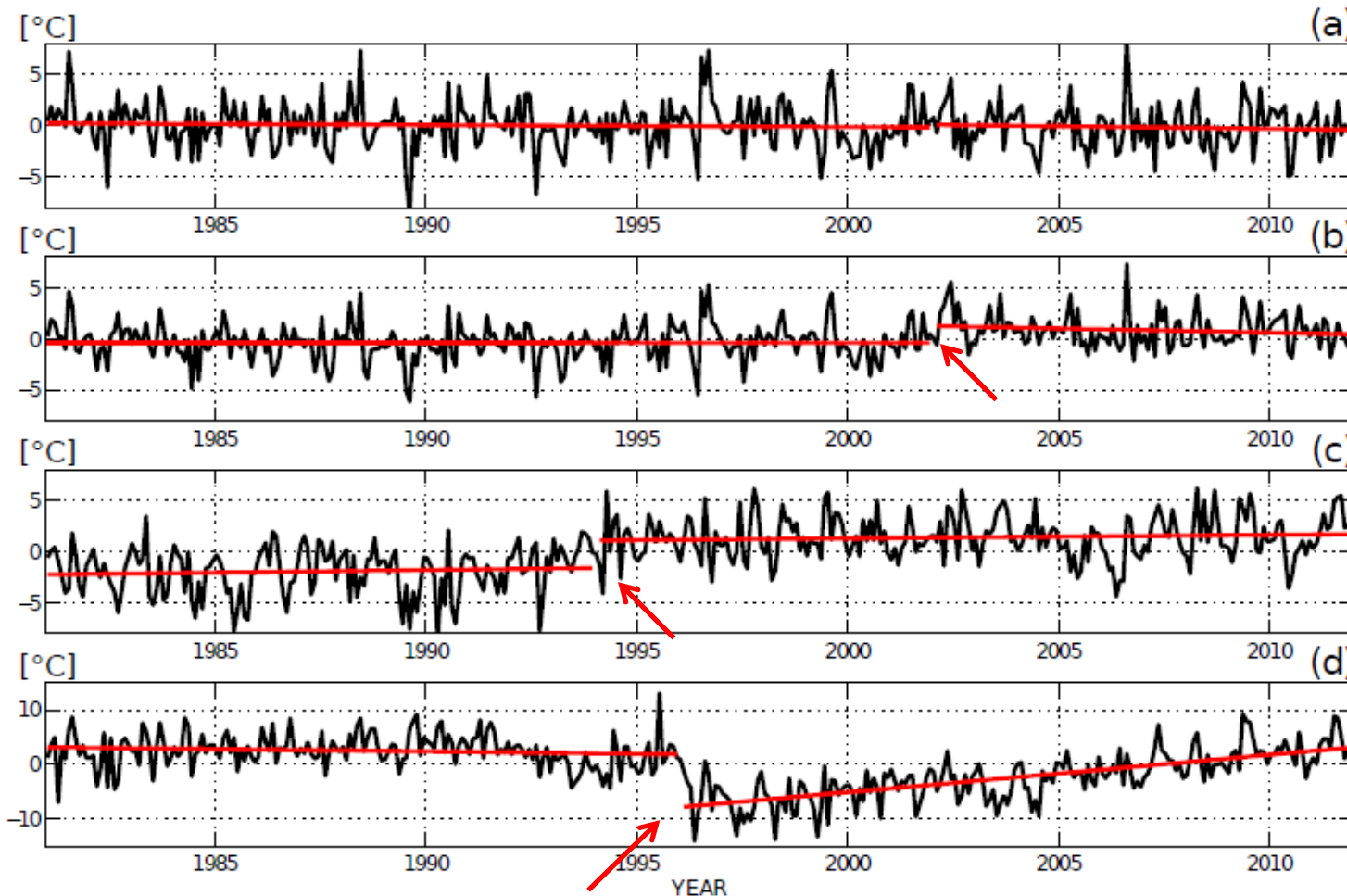


Figure 2: Linear trend of 2m-temperatures [$^{\circ}\text{C}/31\text{yr}$] of monthly anomalies in ERA-Interim over the period of 31 years from 1981 to 2011. The area where the trend is insignificant at the 99%-level (two sided t -test) has been left blank. Positions A to E each refer to the local extrema. The Neumayer station is denoted with a green star symbol.



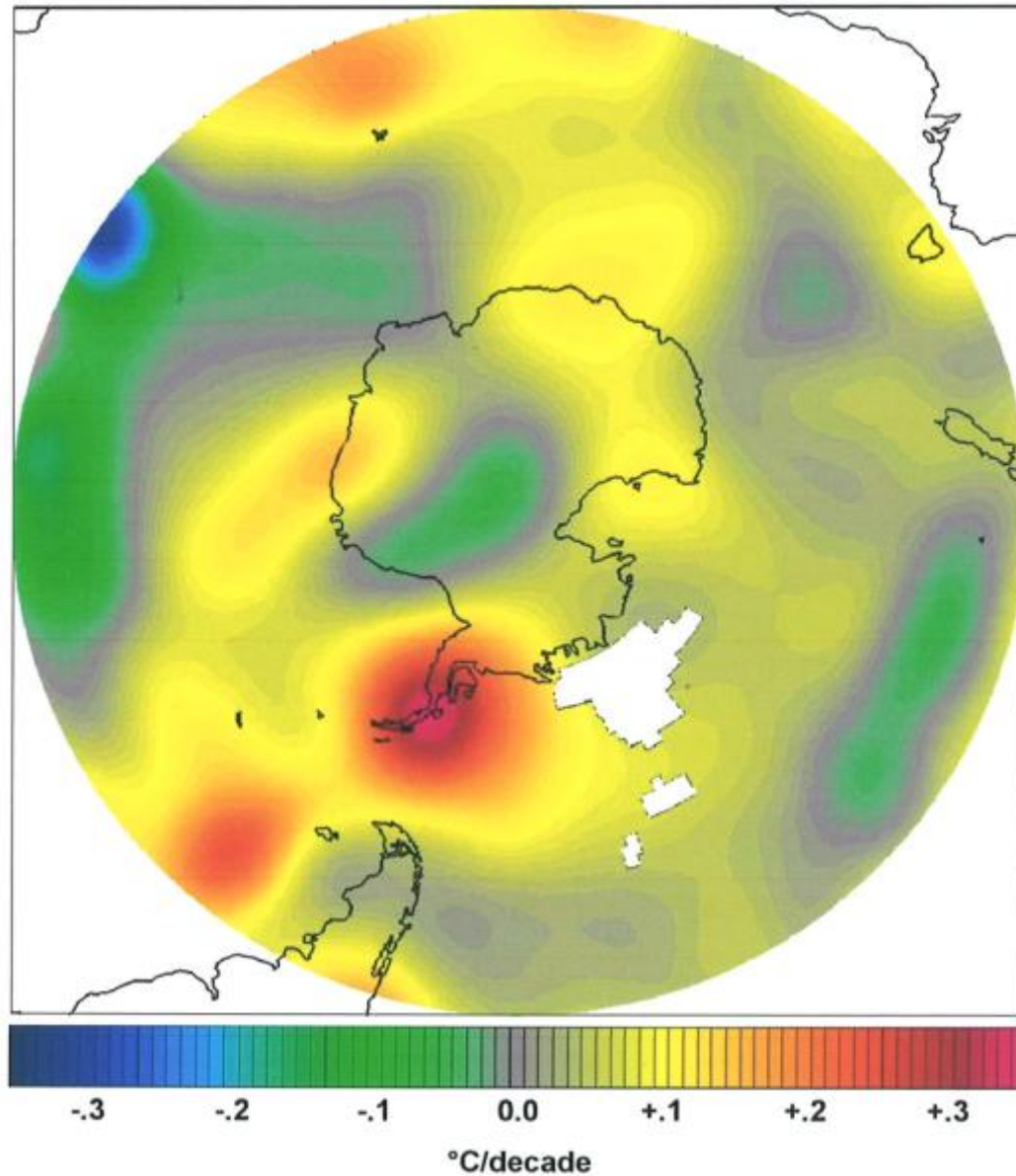
Neumayer
Observations

Neumayer
Reanalysis

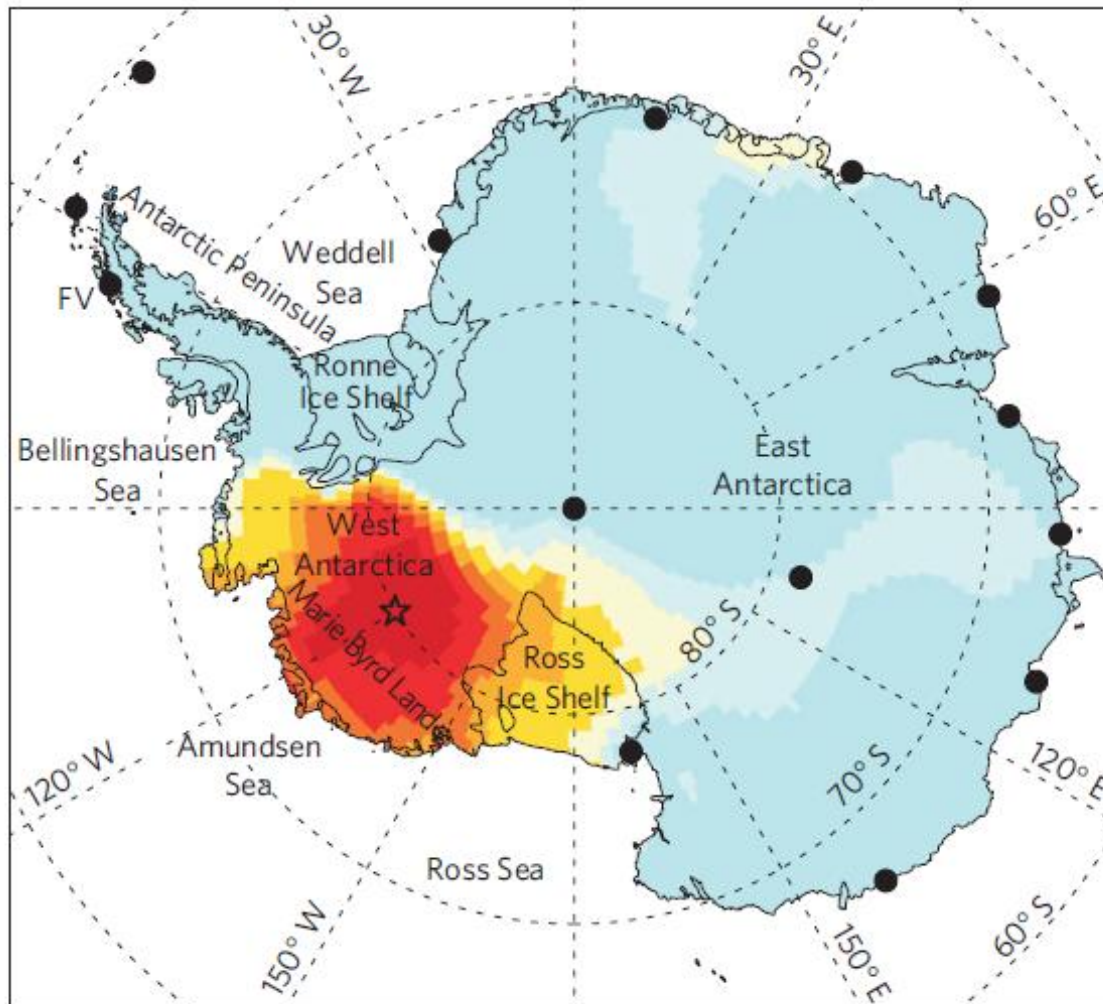
Belgrano
Reanalysis

Edward Land
Reanalysis

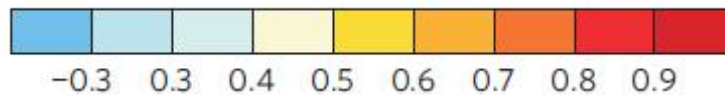
A
Synthesis of
Antarctic
Temperatures
(CHAPMAN
et al., 2006)



Future of West Antarctica?



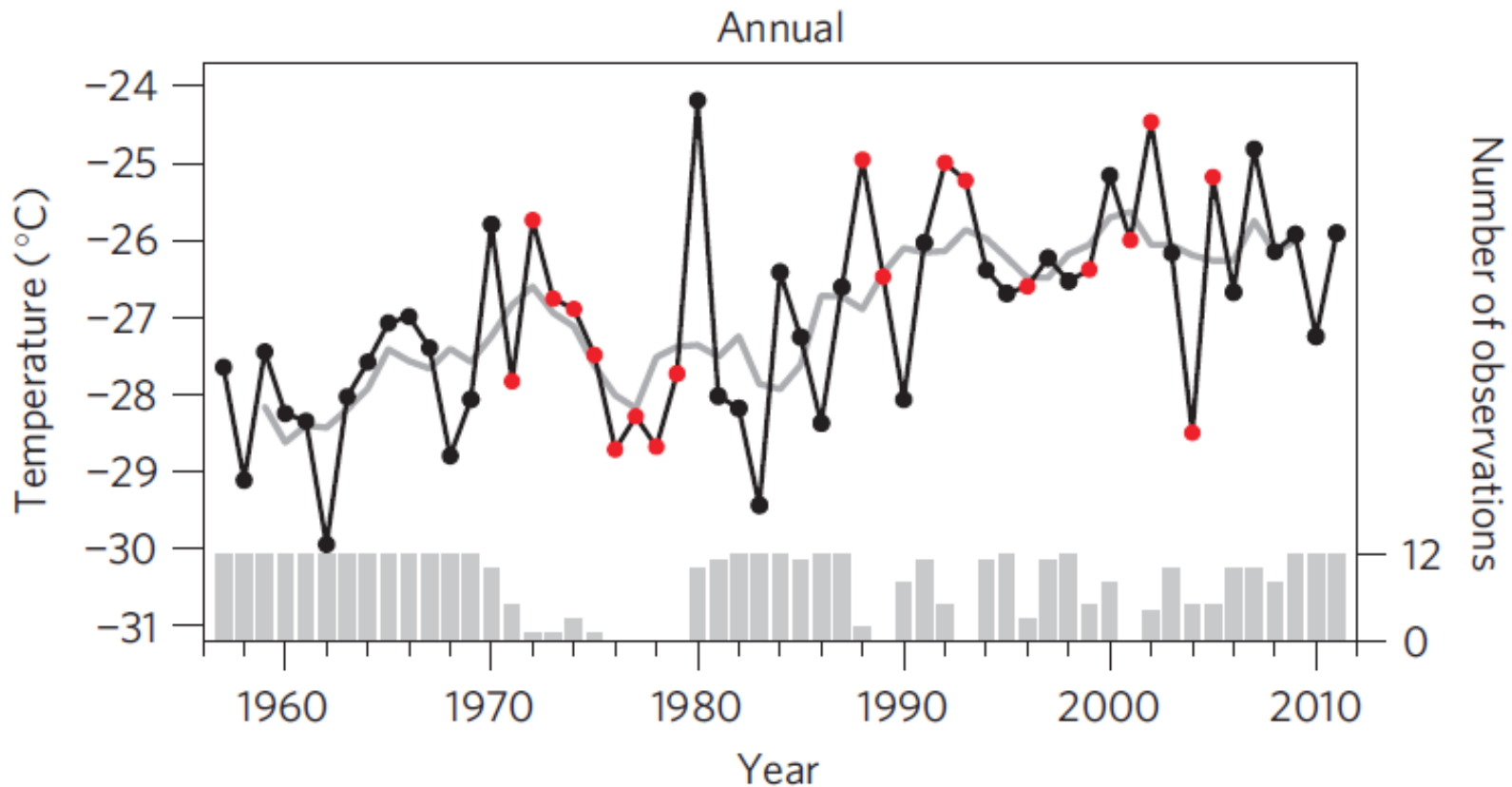
Annual temperature correlation with Byrd



Black dots denote permanent stations with long-term temperature records.

Warming of the Antarctic Peninsula is well monitored by measurements.

Long-term observations in West Antarctica are missing.



Time series from Byrd Station is a composite of man made measurements (1957-1975), AWS data, reanalyses and spatial interpolations

Central West Antarctica among the most rapidly warming regions on Earth

David H. Bromwich^{1*†}, Julien P. Nicolas^{1†}, Andrew J. Monaghan², Matthew A. Lazzara³, Linda M. Keller⁴, George A. Weidner⁴ and Aaron B. Wilson¹

There is clear evidence that the West Antarctic Ice Sheet is contributing to sea-level rise. In contrast, West Antarctic temperature changes in recent decades remain uncertain. West Antarctica has probably warmed since the 1950s, but there is disagreement regarding the magnitude, seasonality and spatial extent of this warming. This is primarily because long-term near-surface temperature observations are restricted to Byrd Station in central West Antarctica, a data set with substantial gaps. Here, we present a complete temperature record for Byrd Station, in which observations have been corrected, and gaps have been filled using global reanalysis data and spatial interpolation. The record reveals a linear increase in annual temperature between 1958 and 2010 by 2.4 ± 1.2 °C, establishing central West Antarctica as one of the fastest-warming regions globally. We confirm previous reports of West Antarctic warming, in annual average and in austral spring and winter, but find substantially larger temperature increases. In contrast to previous studies, we report statistically significant warming during austral summer, particularly in December-January, the peak of the melting season. A continued rise in summer temperatures could lead to more frequent and extensive episodes of surface melting of the West Antarctic Ice Sheet. These results argue for a robust long-term meteorological observation network in the region.

Summary:

- In situ data are strongly needed from nowcasting till climate monitoring.
- Permanently occupied stations are extremely rare but most important.
- Well maintained AWS can be useful to close in situ data gaps.
- West Antarctic temperature changes are still uncertain.
- Do not take products from reanalysis's as reality!
- Models need to be verified using in situ data (not reanalysis's).
- Further model improvements are needed.

Polar prediction stays challenging

