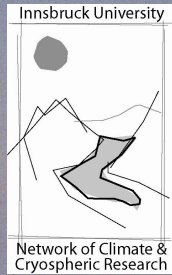


# The precipitation regime of Dronning Maud Land, Antarctica, derived from AMPS (Antarctic Mesoscale Prediction System) archive data

Elisabeth Schlosser<sup>1</sup>, Jordan G. Powers<sup>2</sup>, Michael G. Duda<sup>2</sup>, Kevin W. Manning<sup>2</sup>

*1) Inst. of Meteorology and Geophysics, University of Innsbruck, Austria*

*2) MMM Division, NCAR, Boulder, CO, USA*

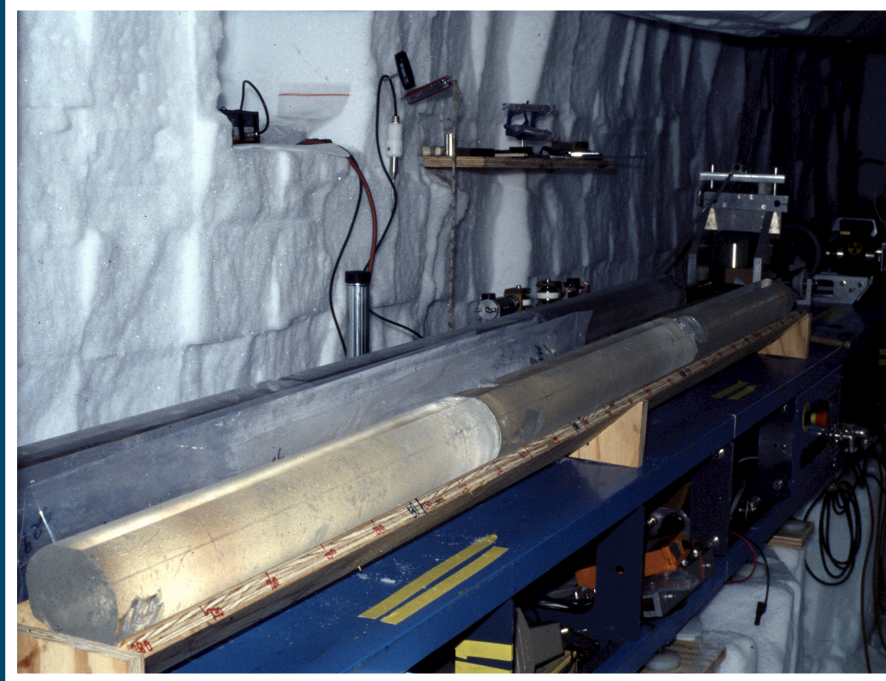


- ✧ Investigation of precipitation regime of DML using **AMPS**  
(Antarctic Mesoscale Prediction System)  
*(with NCAR: Jordan Powers, Michael Duda, Kevin Manning)*
- ✧ Investigation of 65 shallow firn cores (10-160m) from DML  
*(with NPI: Elisabeth Isaksson, and AWI: Hans Oerter)*



# Ice Cores

- very successful in paleoclimatology
- climatic information from ice cores in Greenland and Antarctica, „EPICA“



## Stable isotopes of snow and ice

Stable oxygen isotope ratio of ice (water, snow) :  $\delta^{18}\text{O}$

used to derive paleo-temperature

BUT: depends on: processes during evaporation and condensation

**Thus: we must understand precipitation history!**



# AMPS (Antarctic Mesoscale Prediction System)

AMPS archive: 5.1.2001 – today

disadvantages: only < 7 years available

many changes and adaptations

no re-analysis (yet)

advantages: high resolution

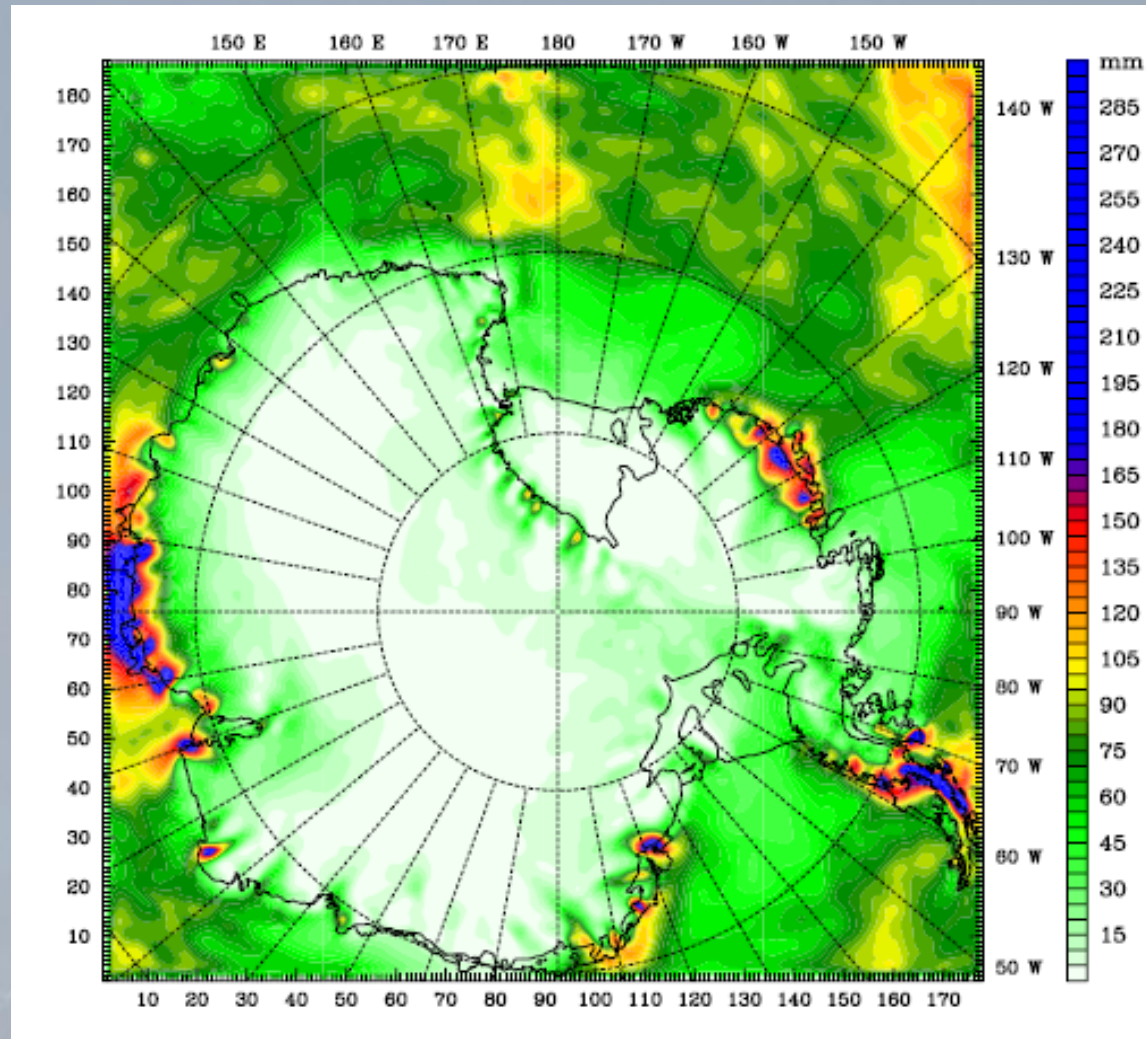
circumpolar

made and tested for practical purposes

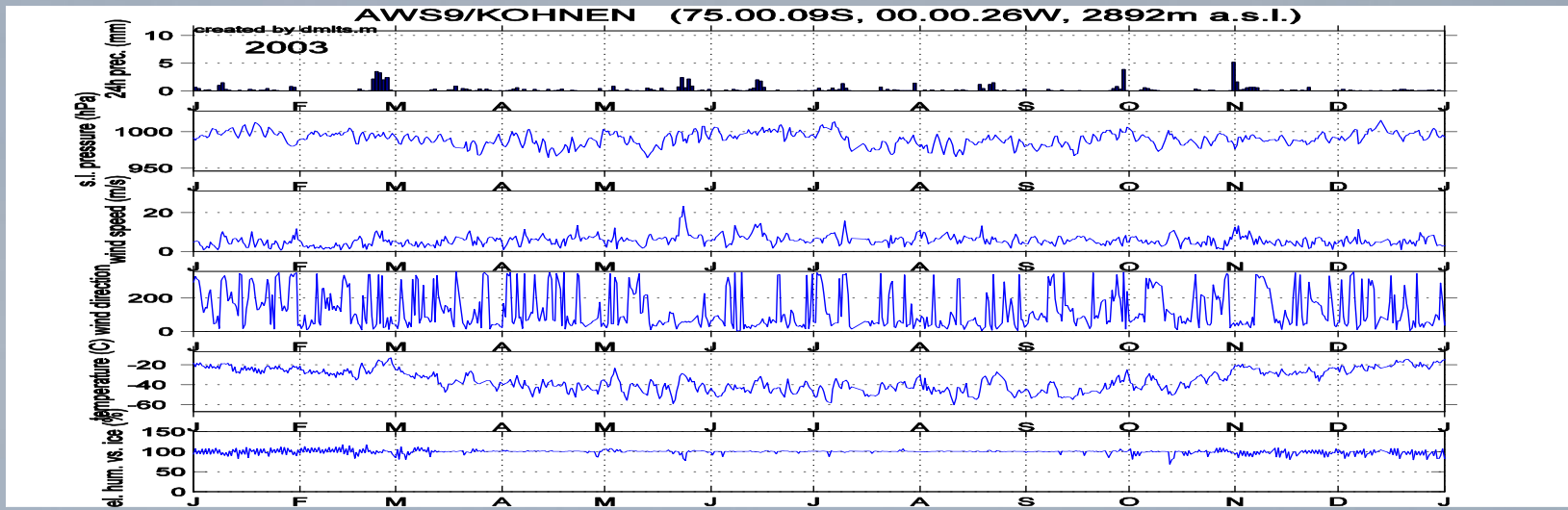
responsible people very nice 😊



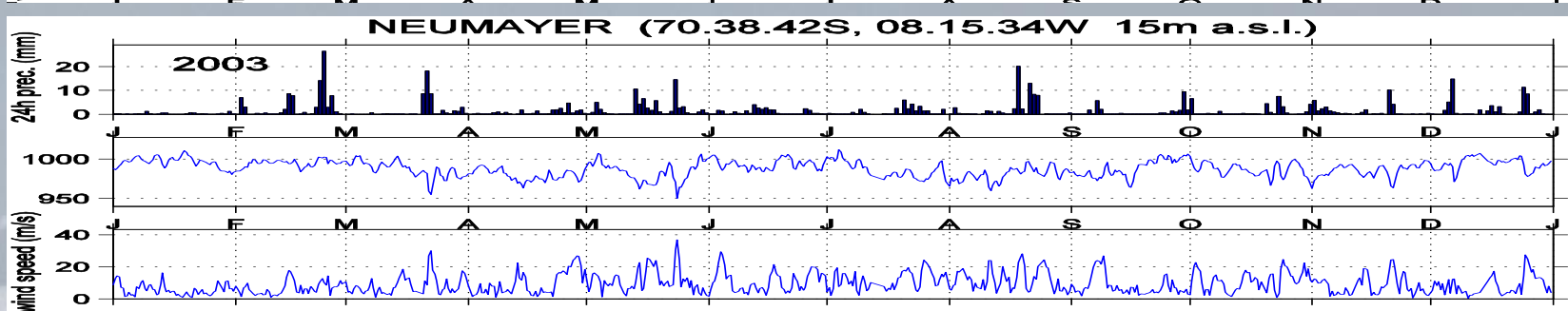
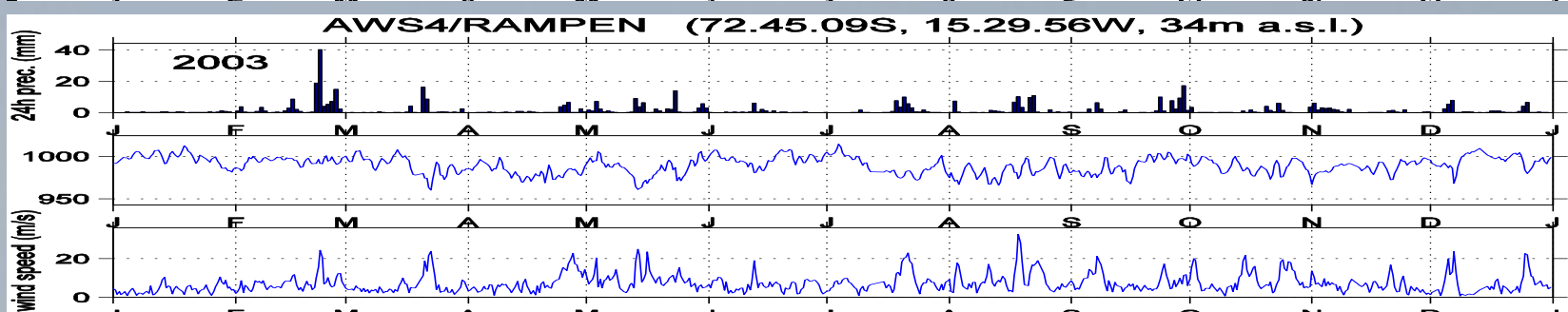
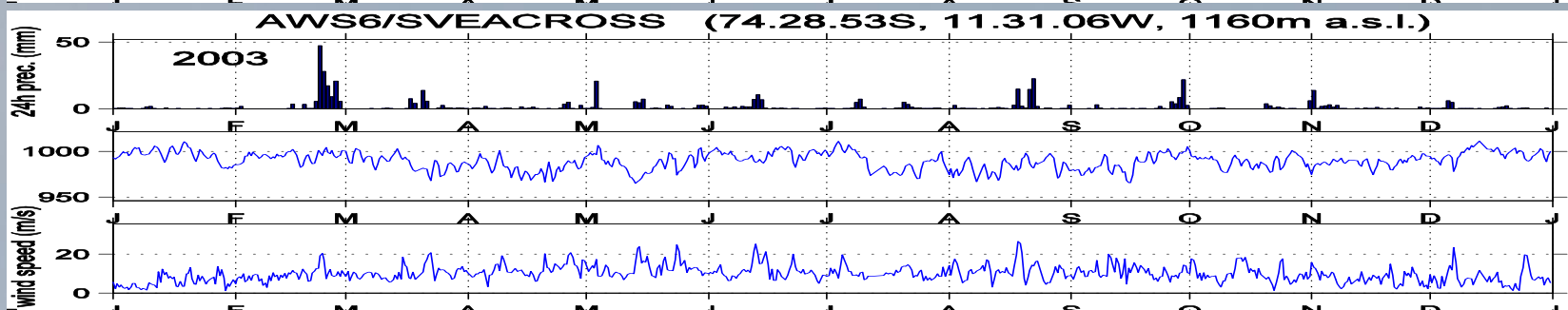
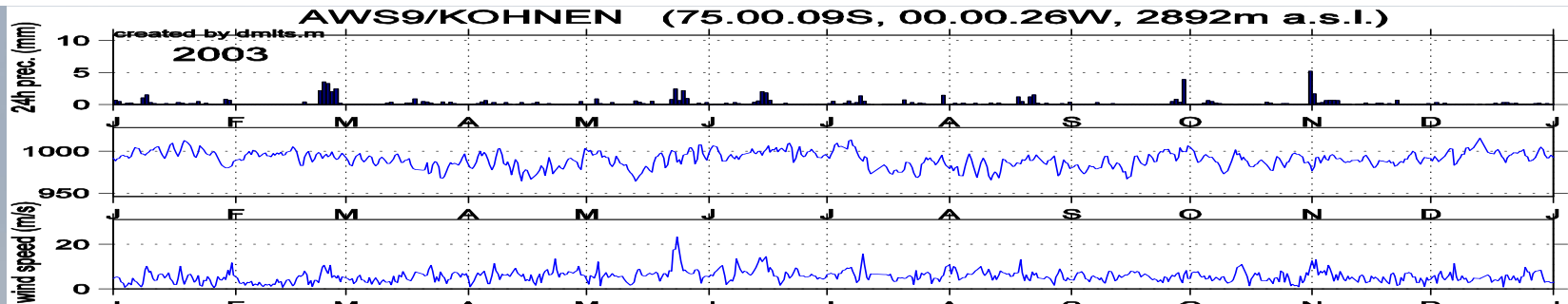
# AMPS – „climatology“



Monthly precipitation Nov. 2001



**AMPS output (!) for AWS location**





## Case study

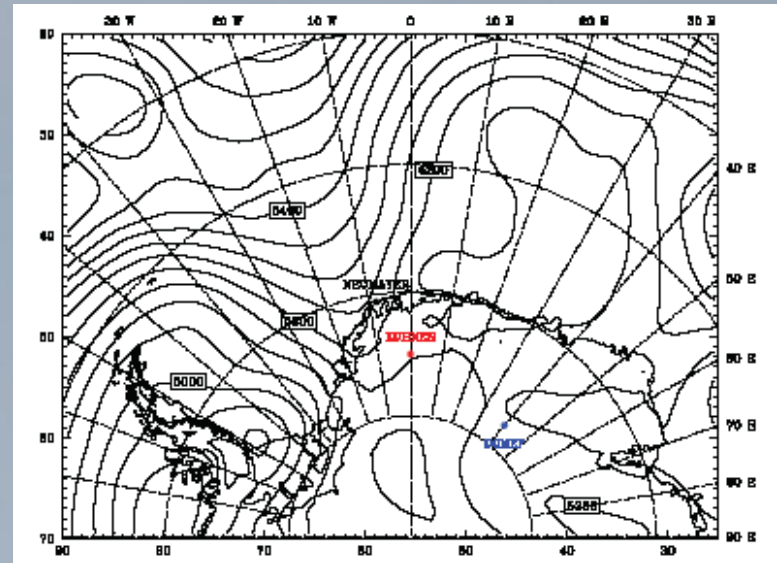
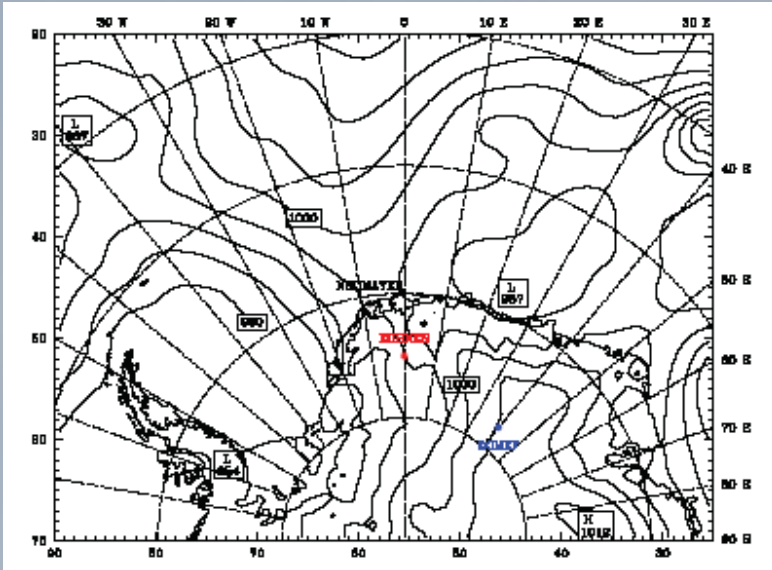
22.-25. February 2003:

High precipitation amounts at all AWS and core locations

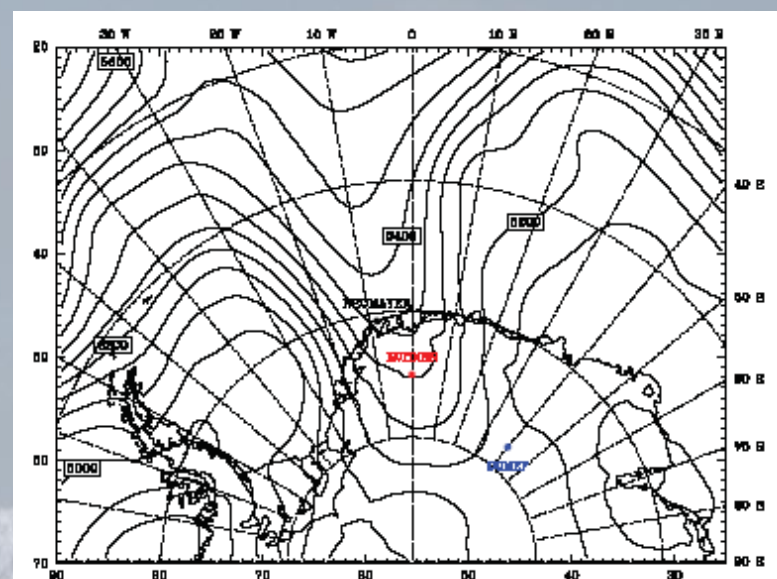
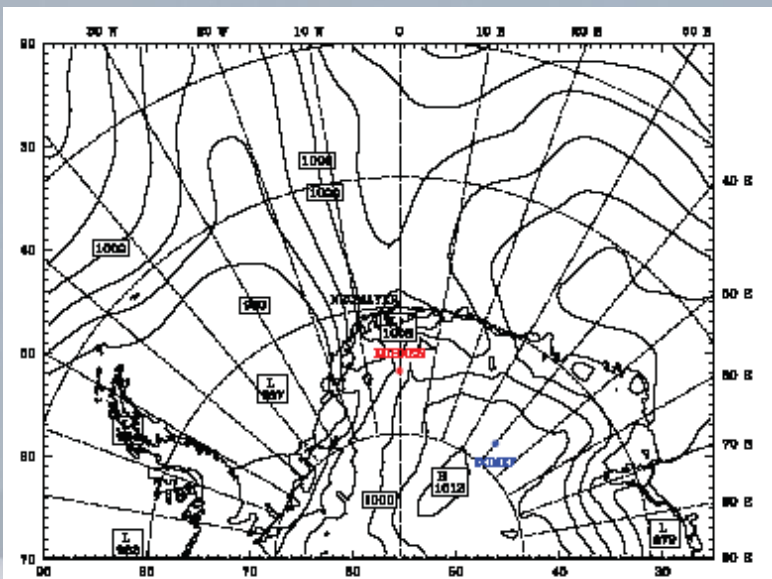


# Sea level pressure and 500hPa geopotential height

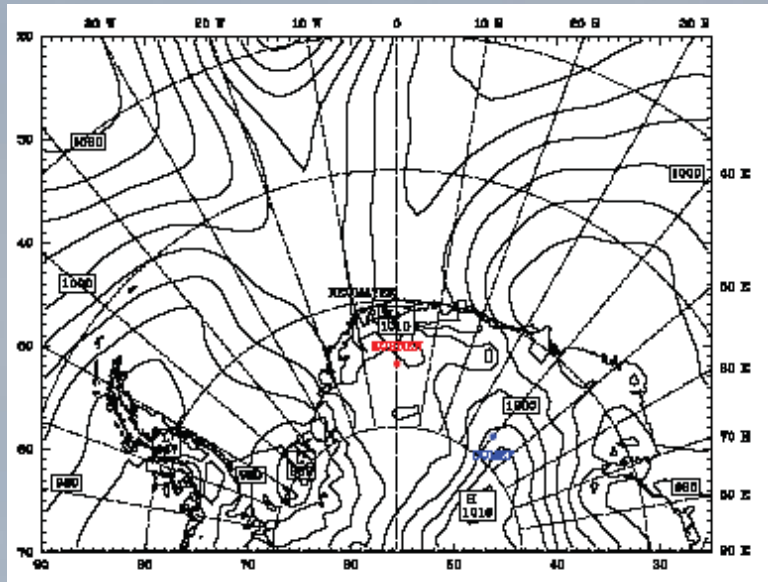
22 Feb



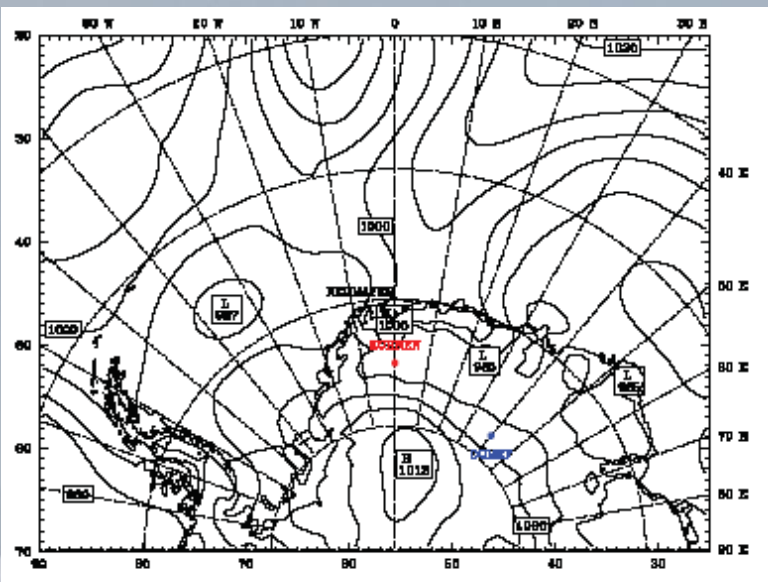
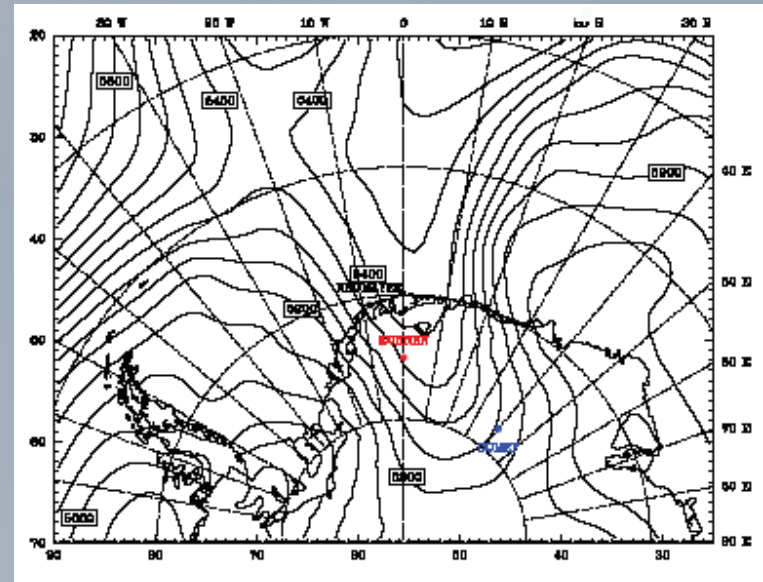
23 Feb



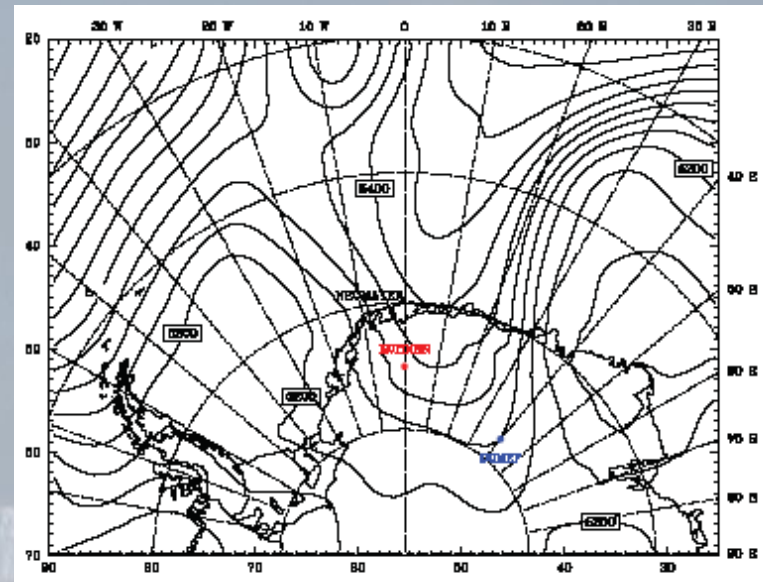
# Sea level pressure and 500hPa geopotential height



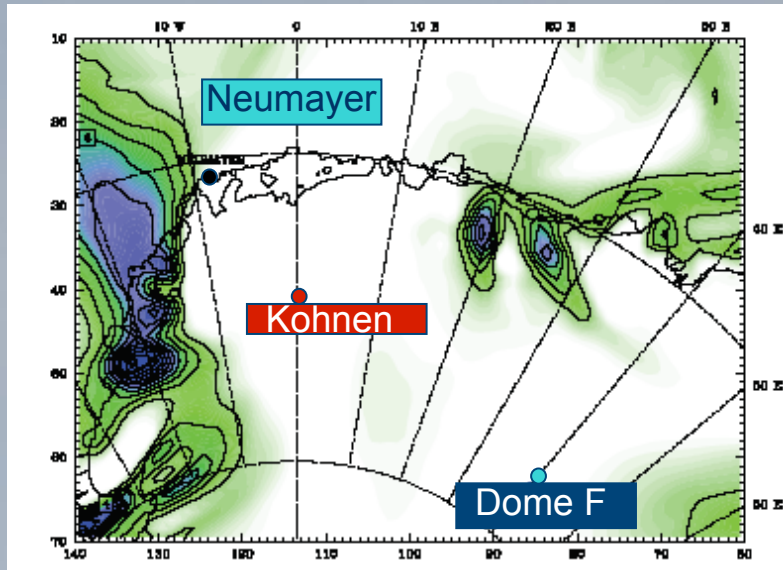
24 Feb



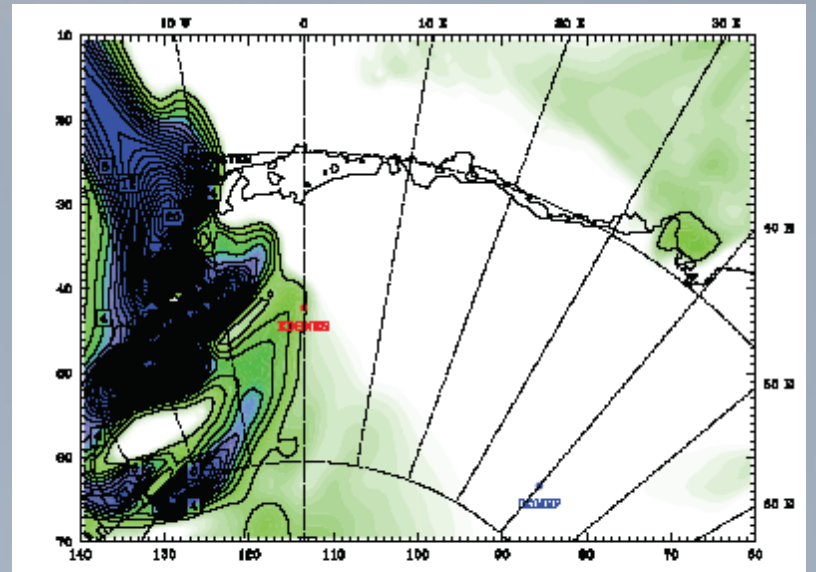
25 Feb



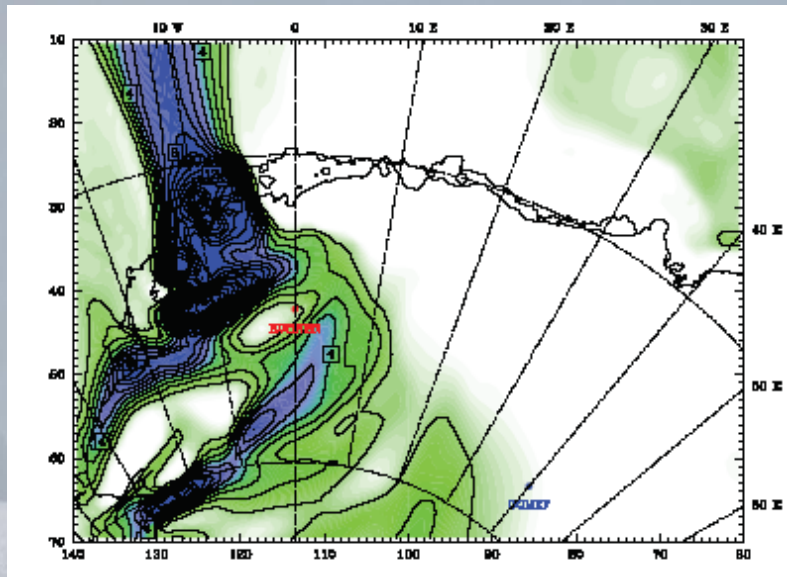
# precipitation



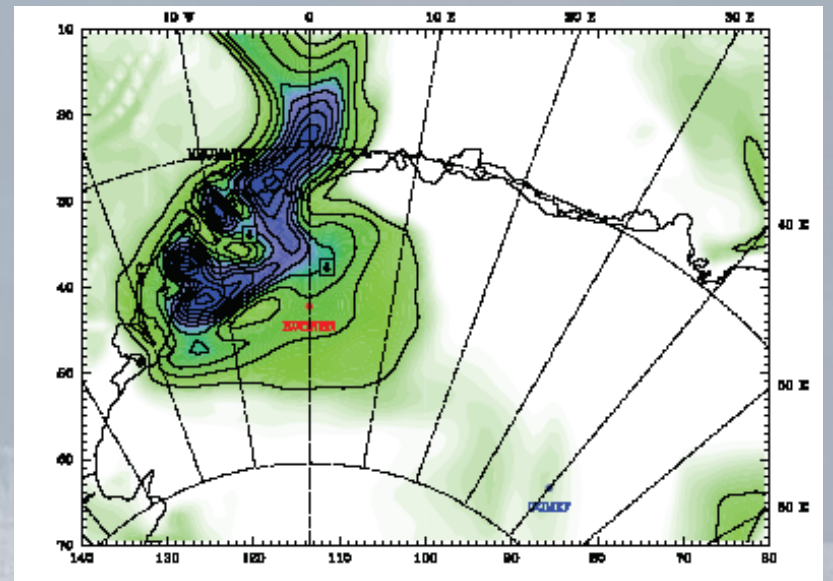
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23 Feb



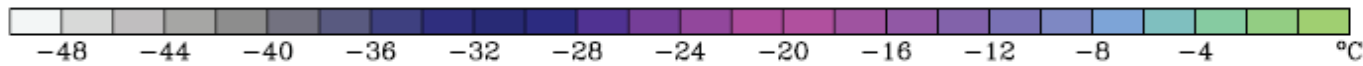
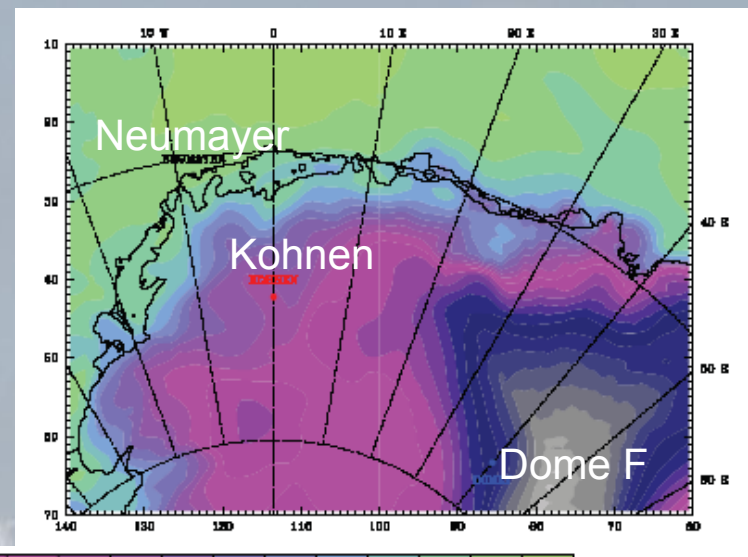
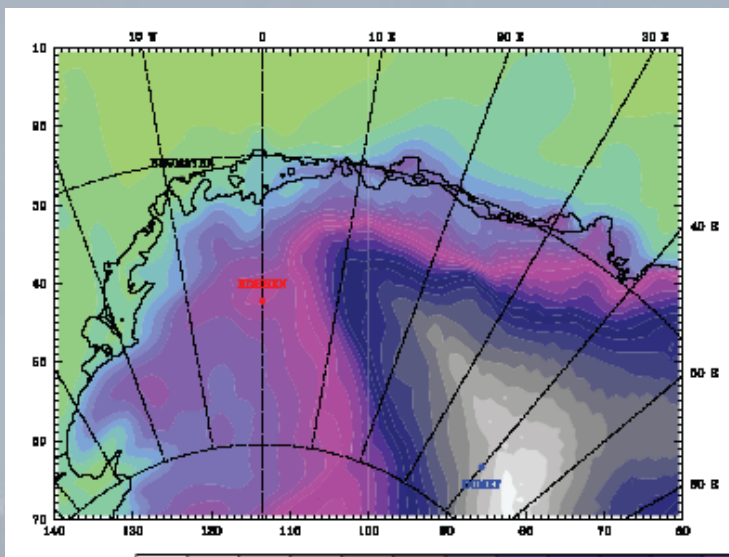
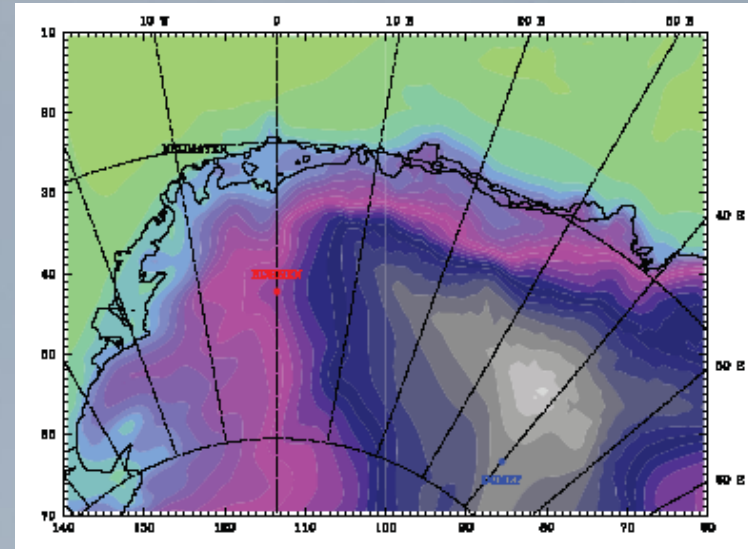
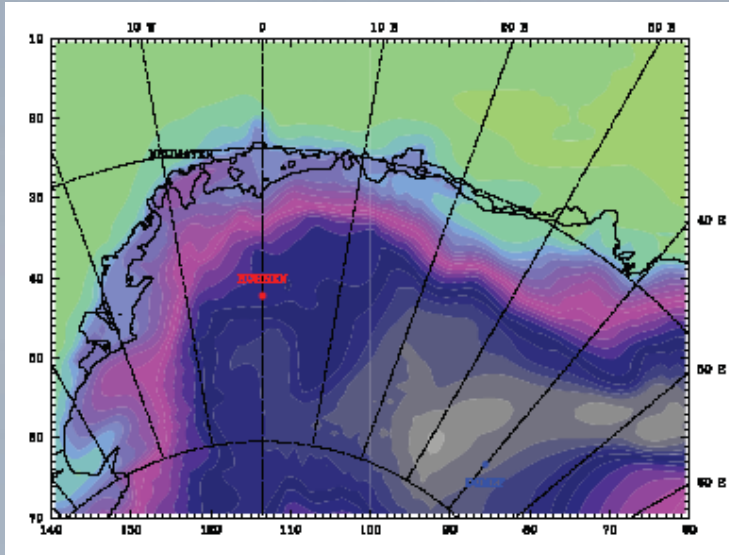
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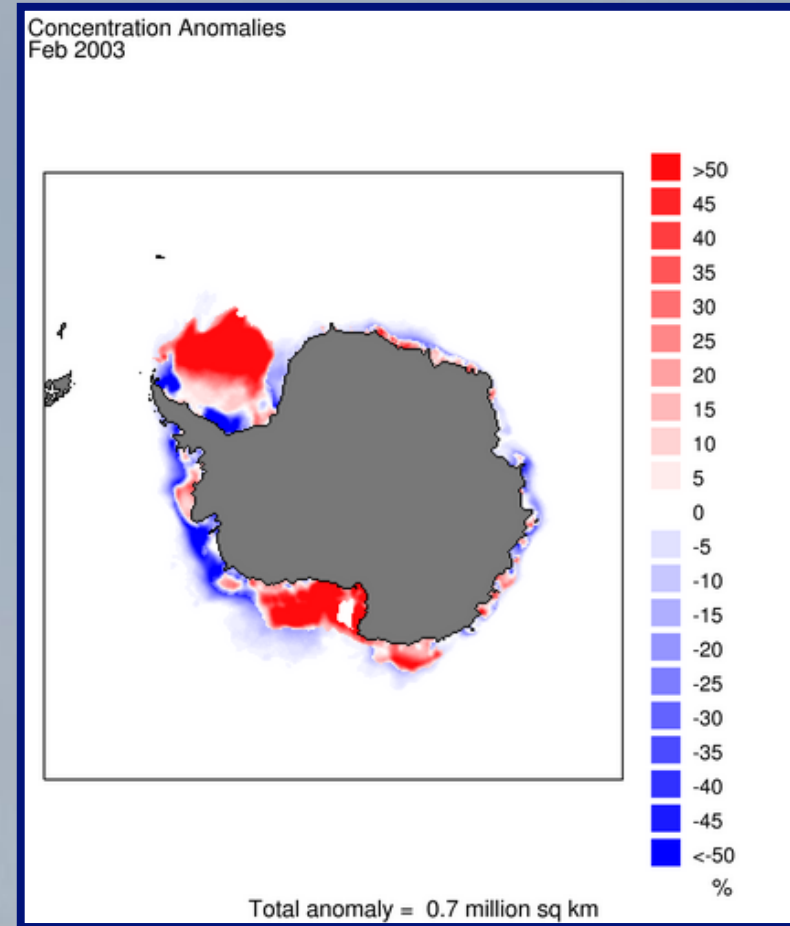
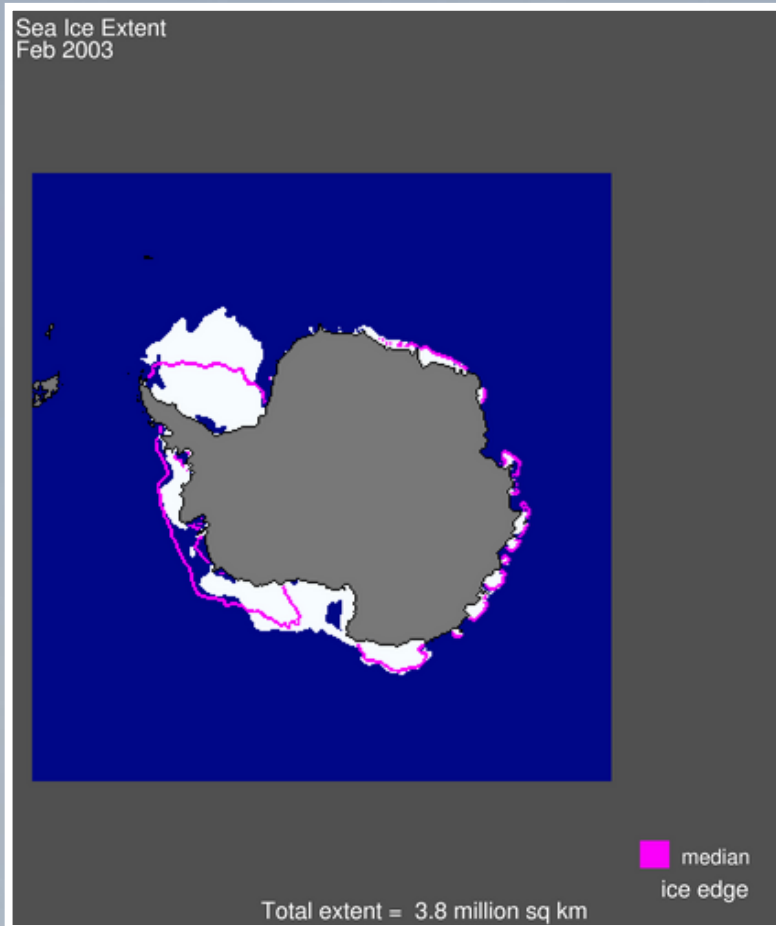
25 Feb



# surface temperature



# Sea ice



## Sea ice extent and concentration anomalies, Feb 2003

(Data courtesy: National Snow and Ice Data Center, CO.)



# Outlook

## Comparison AWS – AMPS

Independent model evaluation using Dutch AWS  
und Dome F daily precipitation measurements

problem: wind!

Case studies of all „major“ events

find (?) similarities in synoptic patterns  
correlation with sea ice extent?



**Thanks for your interest!**

