

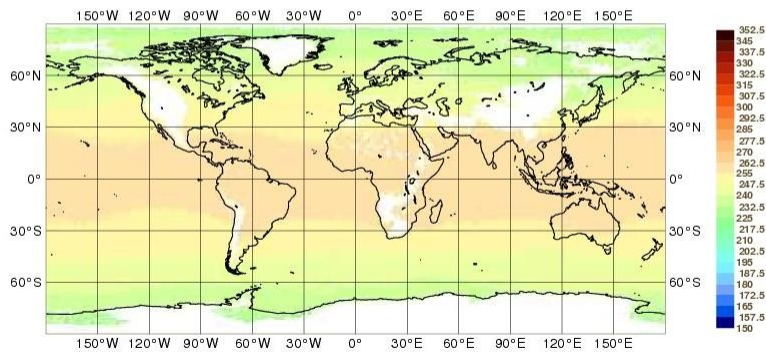
# ECMWF data assimilation over Antarctica

Tony McNally

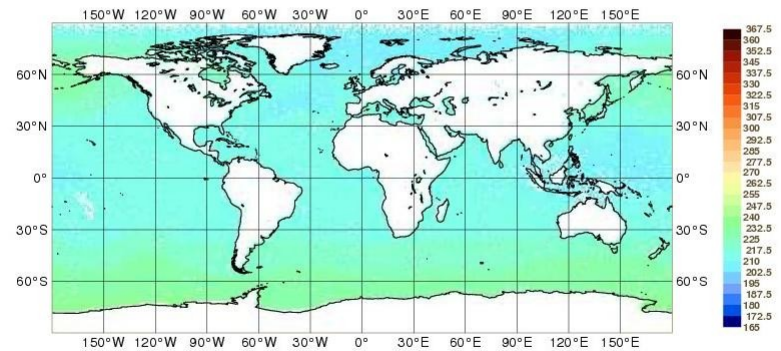
ECMWF

# Tropospheric satellite data usage

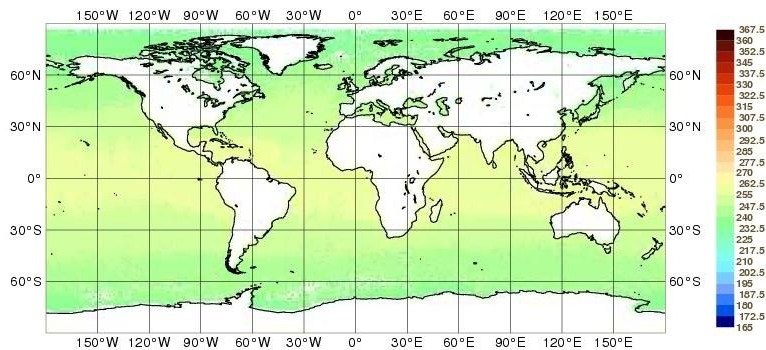
## AMSUA



## IASI



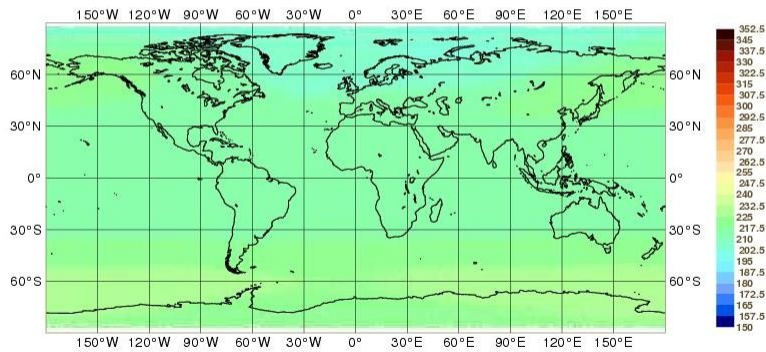
## AIRS



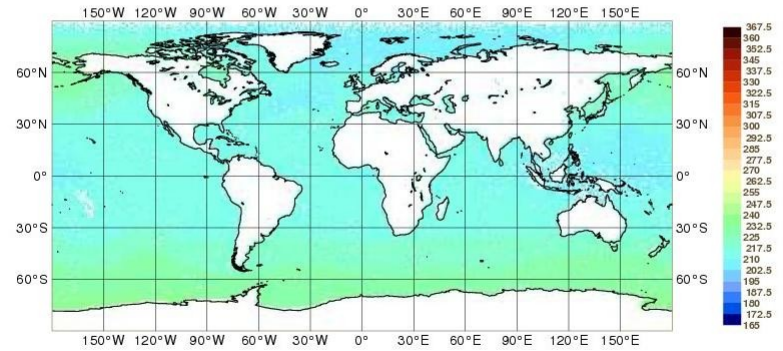
Problems of cloud-detection and surface emission modelling, result in very little tropospheric satellite data being assimilated

# Stratospheric satellite data usage

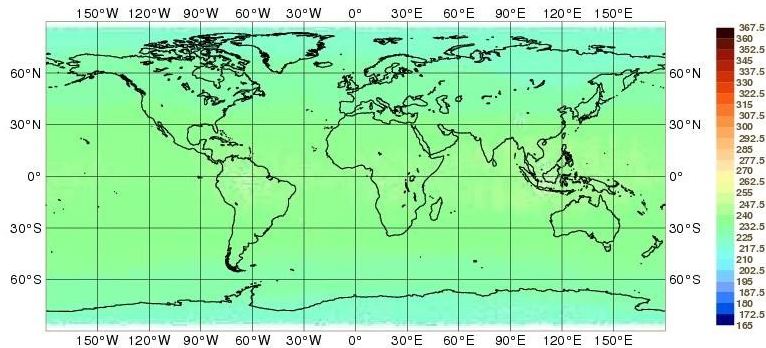
## AMSUA



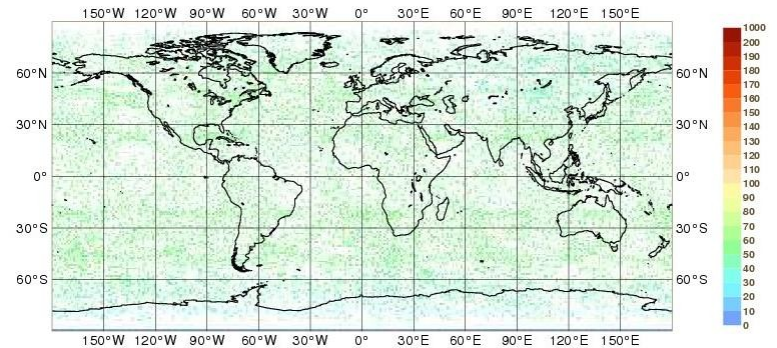
## IASI



## AIRS

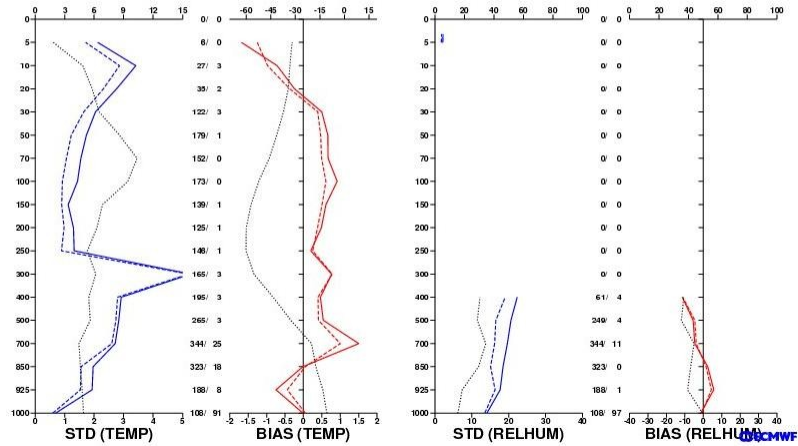


## GRAS GPS

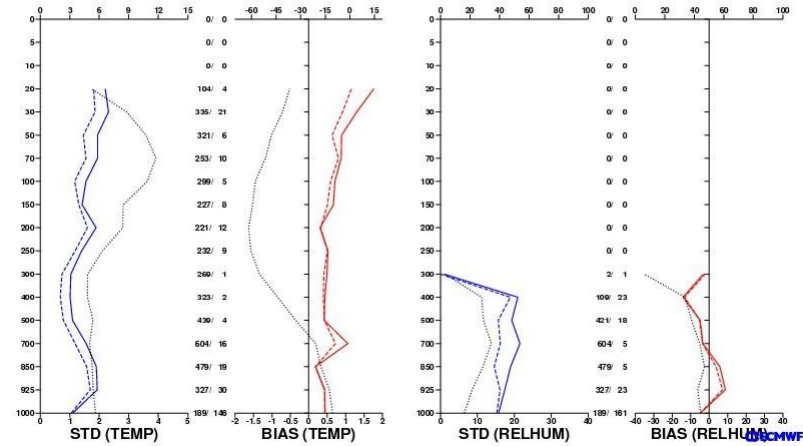


# Radiosonde data usage

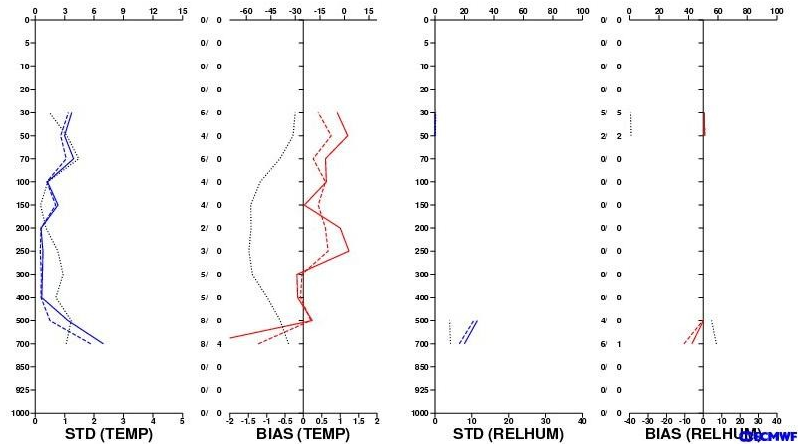
Dumont d'Urville  
15 SEP-30 NOV 2007  
90S-180W/90N-180E  
00/06/12/18 UTC uncorrected data combined



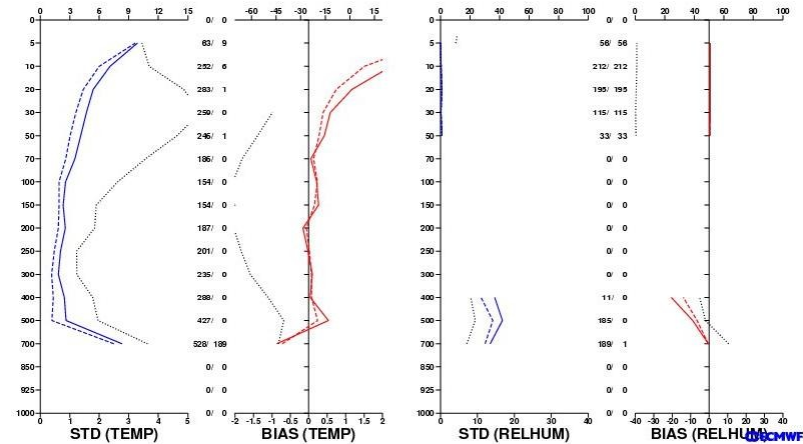
Dumont d'Urville  
15 SEP-30 NOV 2008  
90S-180W/90N-180E  
00/06/12/18 UTC uncorrected data combined



Concordia  
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90S-180W/90N-180E  
00/06/12/18 UTC uncorrected data combined



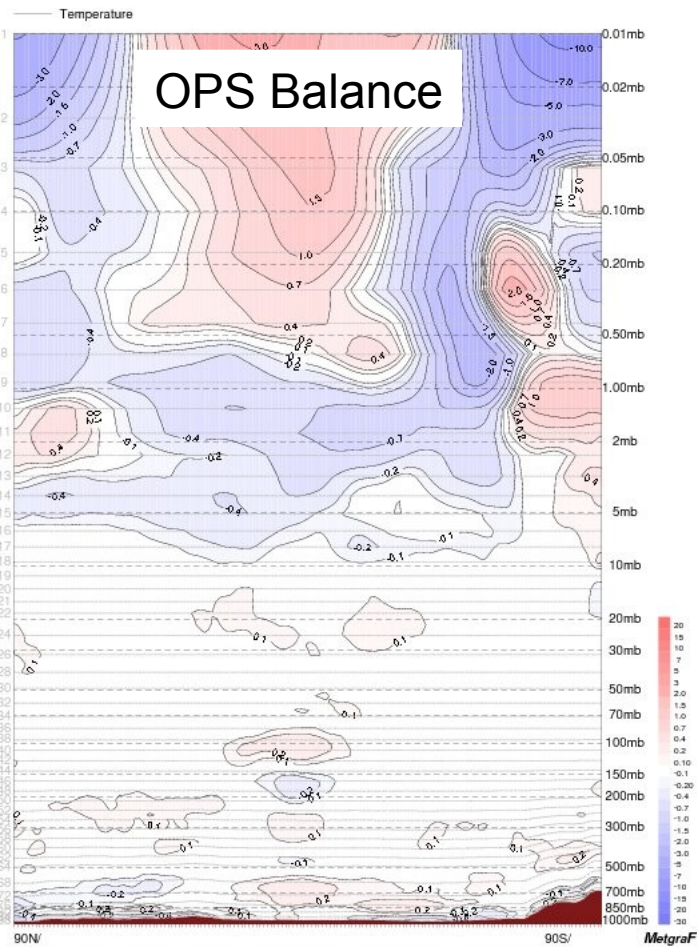
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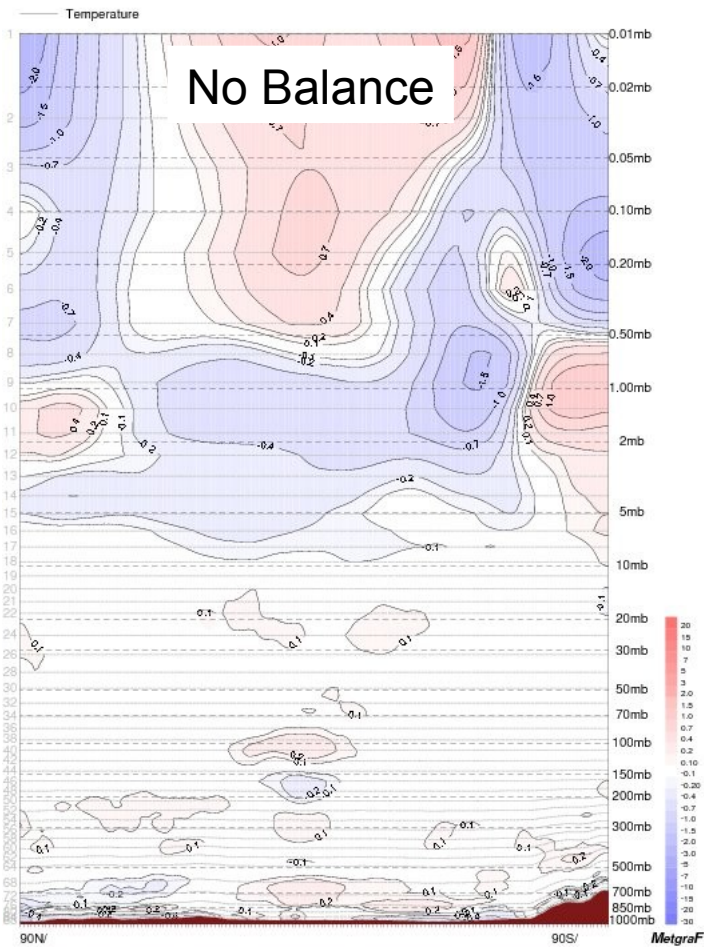
# Assimilation algorithm statistics

Background error statistics are generally poorly known in polar regions. E.g.the choice of statistical balance imposed upon the increments can dramatically impact the temperature analysis in the polar stratosphere.

f1fj 2008 06 monthly mean analysis  
zonal mean. Units: Celsius

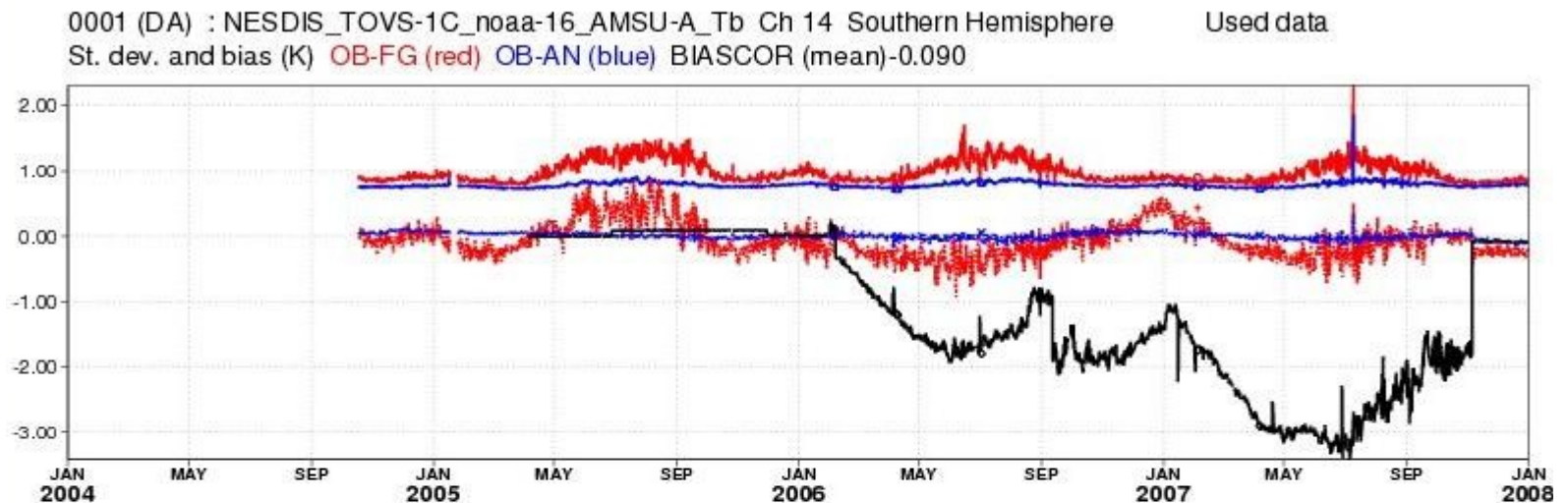


f1fj 2008 06 monthly mean analysis  
zonal mean. Units: Celsius



# Bias correction and Model error

Cloud detection and radiative transfer errors are amplified at the poles. However, systematic model errors (e.g. NOGWD) over the poles (particularly in the stratosphere) mean that traditional approaches to satellite bias correction cannot be done



# Summary

- Use of tropospheric satellite data is very limited (surface emission / cloud detection)
- Use of stratospheric satellite data is extensive
- Assimilation statistics are very important and are often difficult in polar regions
- Model systematic error make satellite bias correction difficult.