# Score verification issues an example

Jean-Noël Thépaut ECMWF October 2012

and many colleagues from ECMWF (special thanks to Gabor Radnoti, Martin Janousek, Tony McNally)



## **Cycle 38R1: High-resolution scores**

2011/09/02-2011/12/21, verified with <u>own analysis</u>

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				•								MWE

## **Cycle 38R1: High-resolution scores**

2011/09/02-2011/12/31, verified with <u>observations</u> only 12-hourly rmse

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# Relevance of own analysis for verifying forecasts

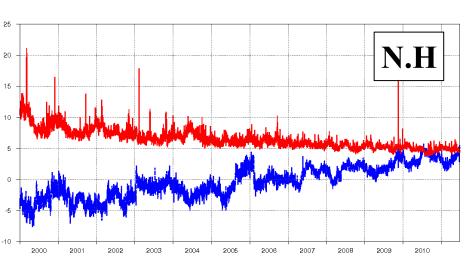
History Met Office – ECMWF analysis difference (Z500)

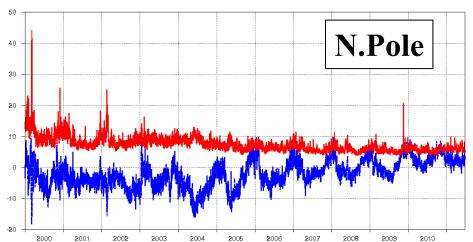
Thanks Martin Janousek

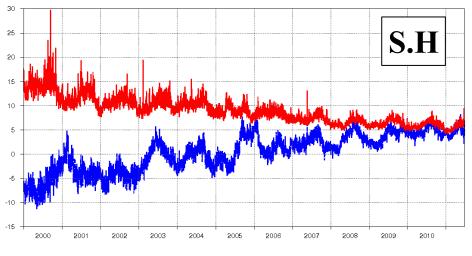


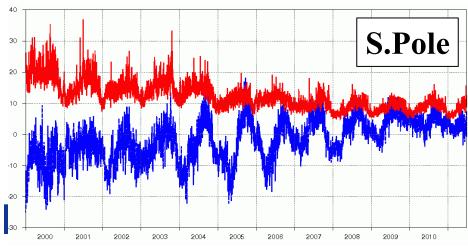
# History Met Office – ECMWF analysis difference (Z500) BLUE=mean RED=sdev

## Martin Janousek







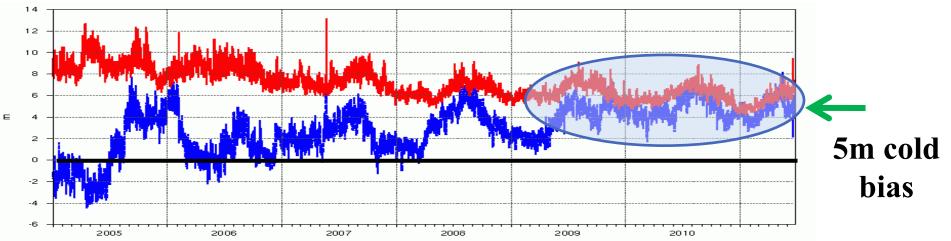


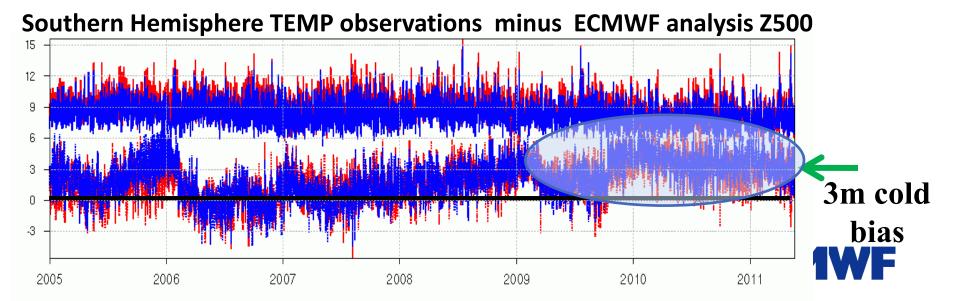
...who is right and who is wrong ...?



# Comparison with TEMP observations

Southern Hemisphere Met Office minus ECMWF analysis Z500





## **Alternative to own analyses**

## Different analyses

They have also but different biases

## Multi-analyses

- Mean
- Randomly picked

### Observations

- Representativeness
- Data coverage (big advantage of using satellite data)
- They are not perfect either



### **Sensitivity study:**

## **Comparison with various analyses:**

T-850 hpa

- own analysis: \_\_\_\_\_
- radiosonde observations: ------
- TIGGE mean of UKMO, NCEP, CMC and JMA analyses: ------
- TIGGE random pick from UKMO,
   NCEP, CMC and JMA analyses: -----

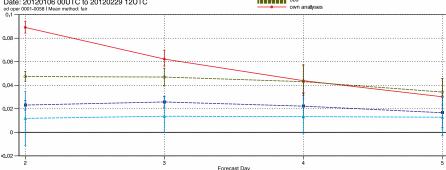
\*: ECMWF deliberately excluded from verification database

\*\*: "best" systems included

#### Normalised differences of 0058 vs 0001 scores

850hPa temperature Root mean square error NHem Extratropics (lat 20.0 to 90.0, lon -180.0 to 180.0) Date: 20120106 00UTC to 20120229 12UTC

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TIGGE mean anl
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#### Normalised differences of 0058 vs 0001 scores

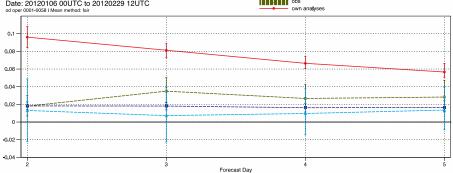
850hPa temperature

Root mean square error

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#### Normalised differences of 0058 vs 0001 scores

850hPa temperature
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### **Sensitivity study:**

## **Comparison with various analyses:**

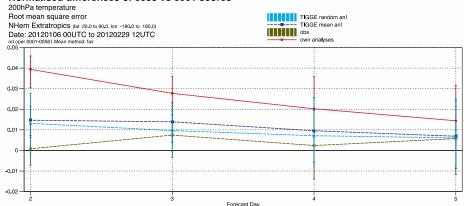
T-200 hpa

- own analysis: \_\_\_\_\_
- radiosonde observations: ------
- TIGGE mean of UKMO, NCEP, CMC and JMA analyses: ------
- TIGGE random pick from UKMO,
   NCEP, CMC and JMA analyses: -----

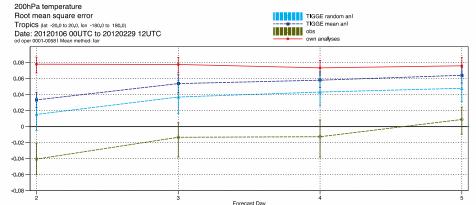
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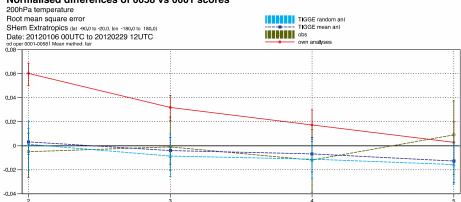
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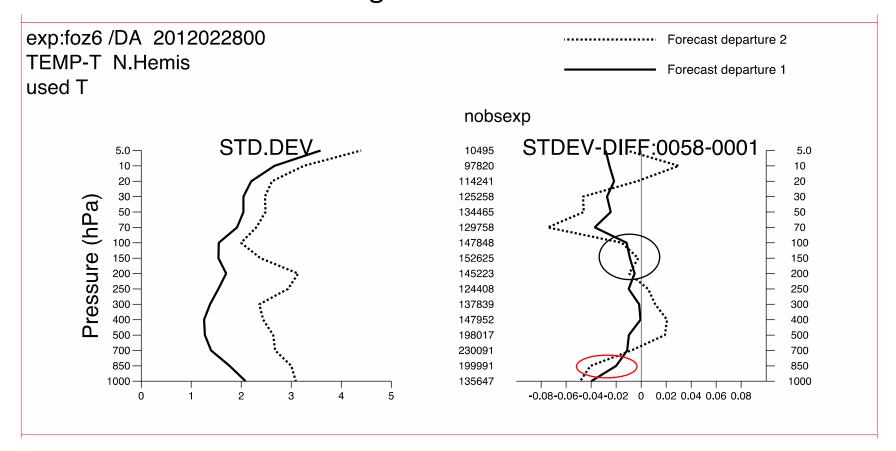
#### Normalised differences of 0058 vs 0001 scores



#### Normalised differences of 0058 vs 0001 scores



## Another way of verifying: processing the forecasts through our assimilation suite



Confirmation of previous scores

First issue: bias correction of observations

Second issue: R/S data coverage

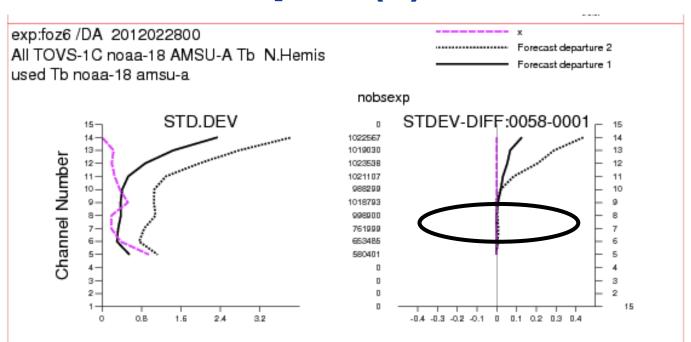


## Work in progress: direct comparison of model forecast with satellite observations

- Pros:
  - full data coverage (as good as analyses)
- Cons:
  - Representativeness and interpretation

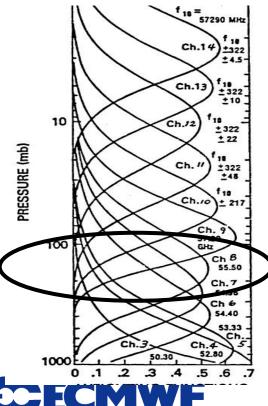


## Two examples (1): AMSU-A

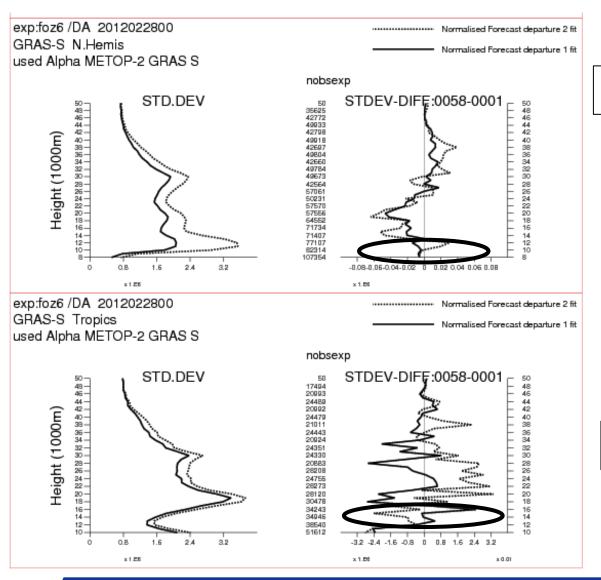


Brightness temperatures

### Northern Hemis.



## Two examples (2): GPSRO (unbiased dataset)



Northern Hemis.

Bending angles

**Tropics** 



## conclusions

- Very much work in progress
- Investigate further the relevance of the TIGGE resource internally
- Promote a more systematic comparison in observation space
  - Possibly requires an additional level of abstraction
  - Satellite data verification can be cross-checked with more standard R/S verification



## **Thank You**

