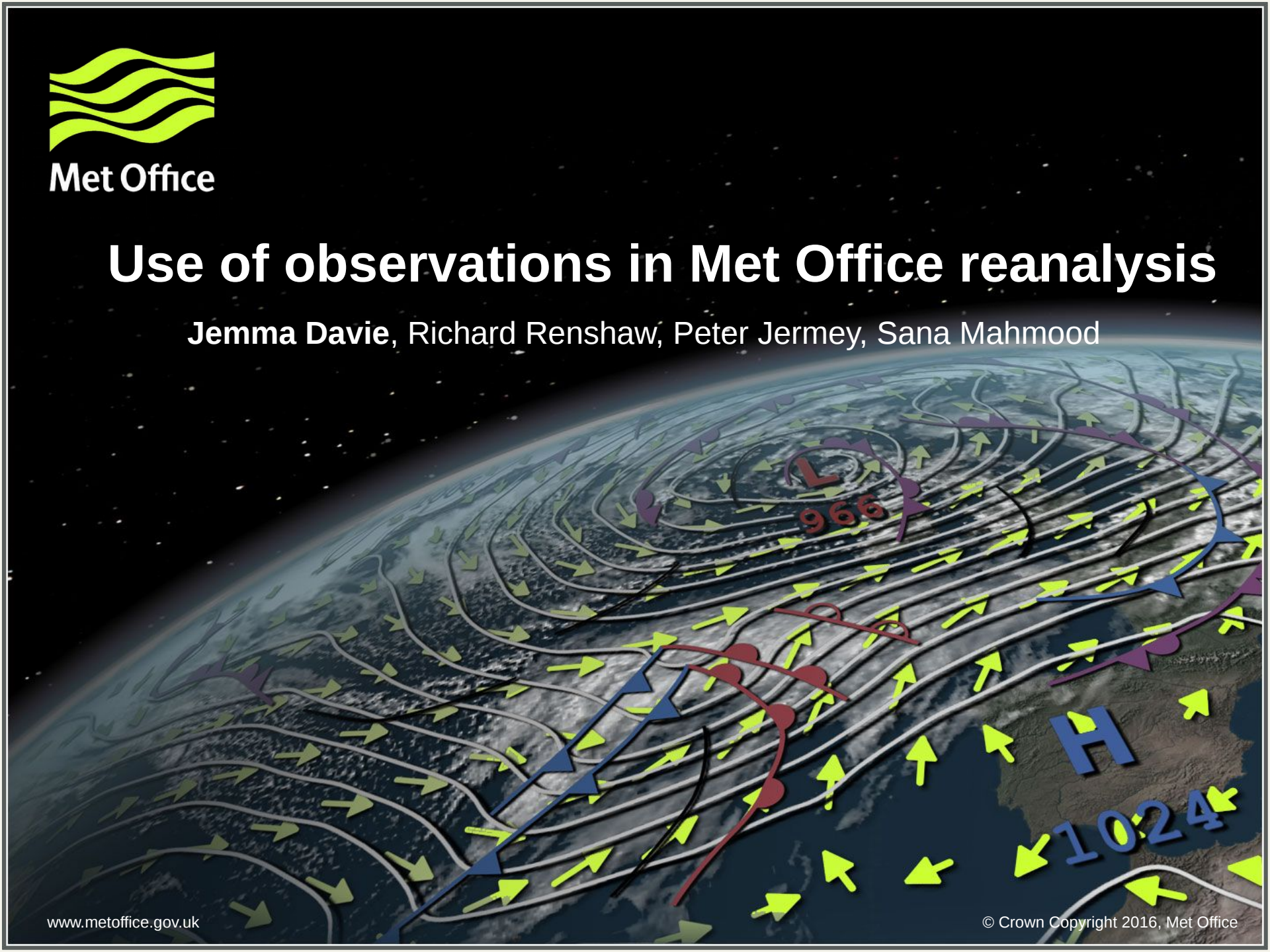


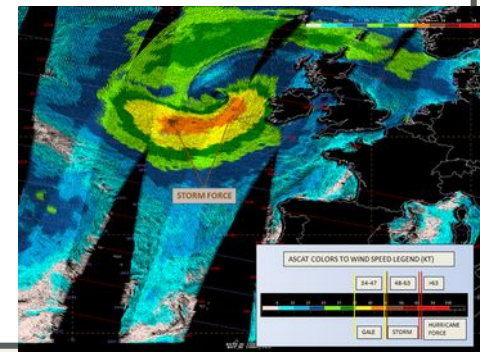
# Use of observations in Met Office reanalysis

Jemma Davie, Richard Renshaw, Peter Jermey, Sana Mahmood

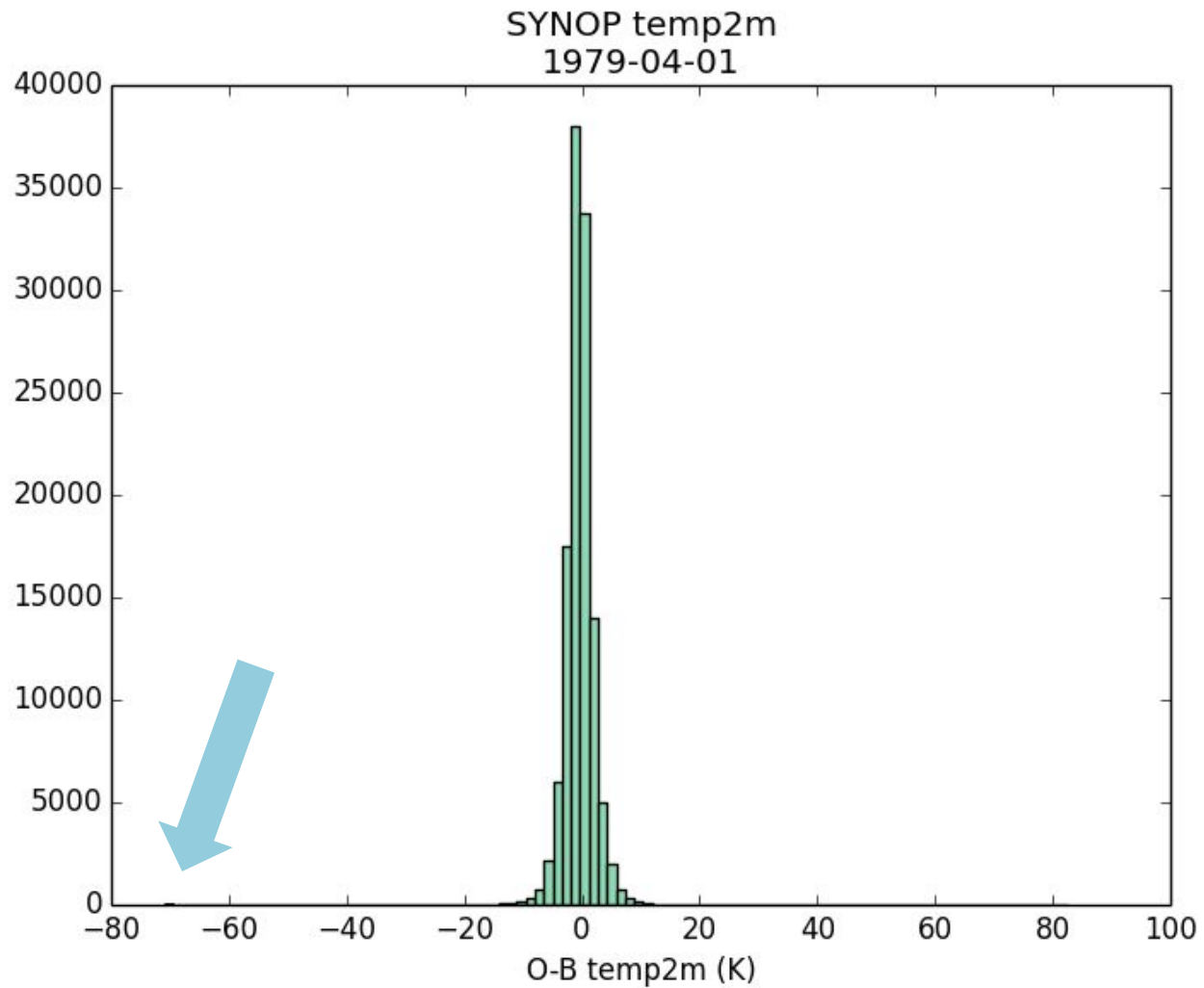


## Observations being used

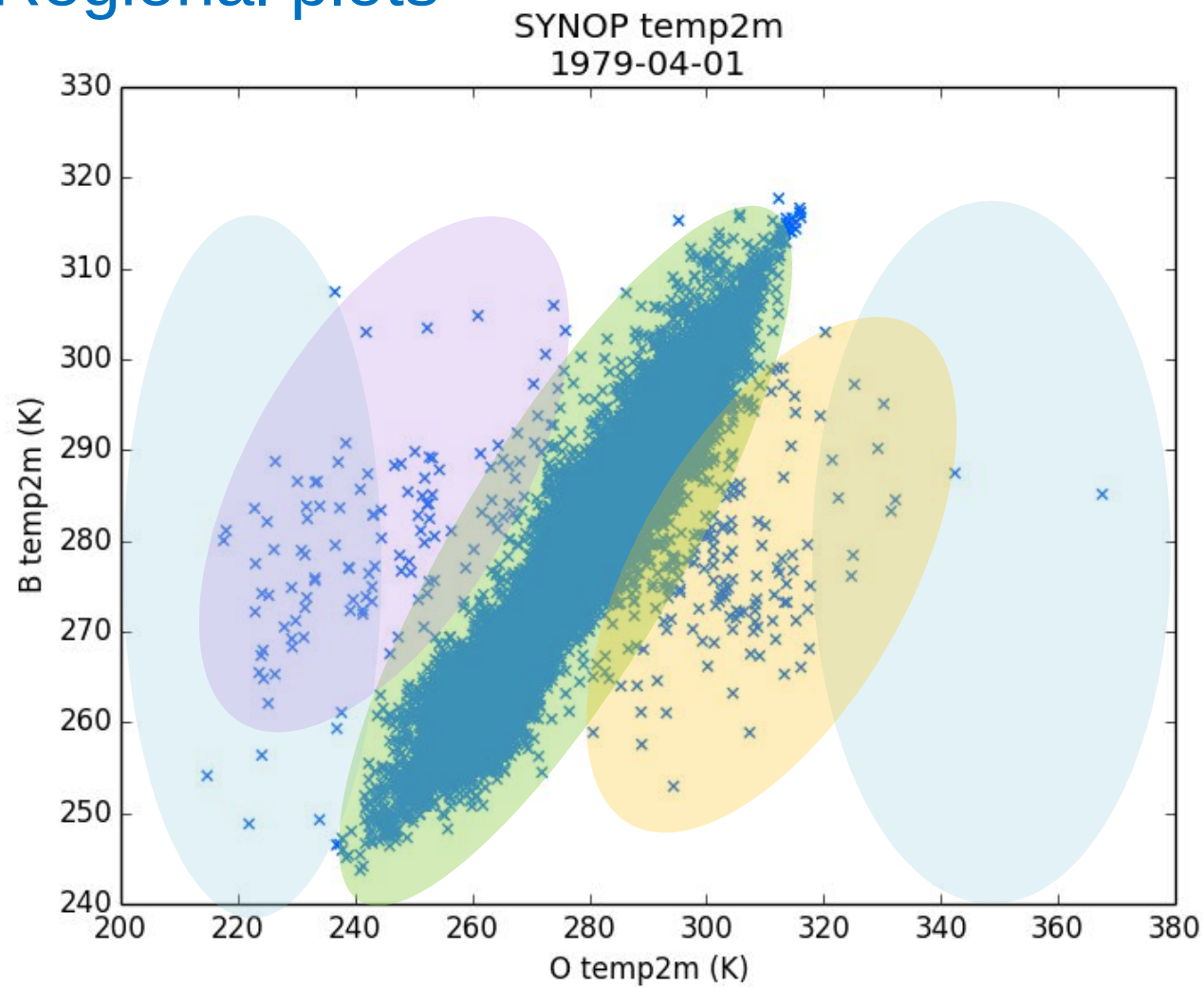
- Conventional Observations from the ECMWF archive
- Satellite Radiances (level 1b) – at least TOVS, ATOVS, AIRS, IASI from ECMWF
- Reprocessed (consistent) satwinds – EUMETSAT & CIMSS
- Reprocessed (consistent) scatterometer winds – KNMI (Ocean SAF)
- Reprocessed (consistent) GPSRO - UCAR
- Reprocessed (consistent) Ground based GPS
  - Rosa Pacione at Agenzia Spaziale Italiano with Gemma Halloran (MO)
  - Reformatted to BUFR (400 European stations)



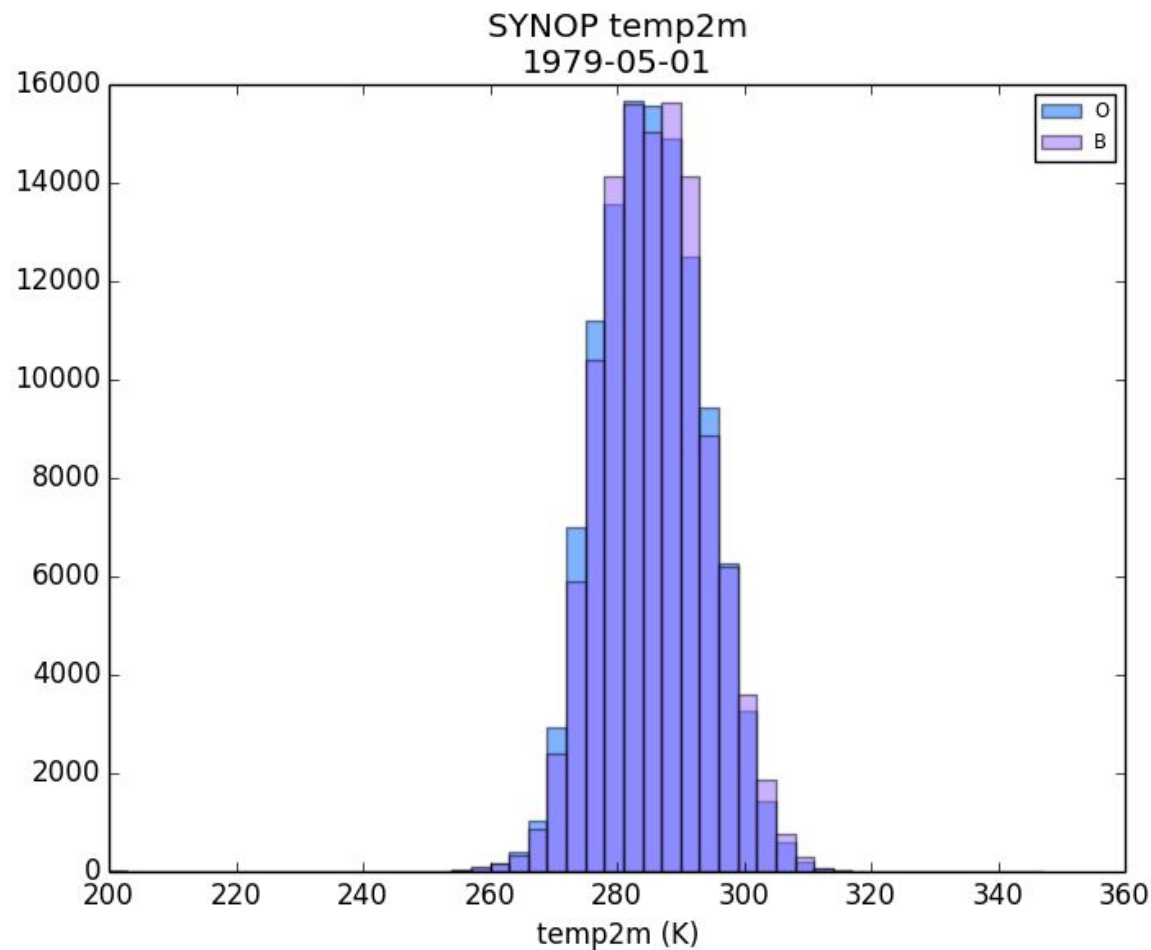
## Regional plots



## Regional plots

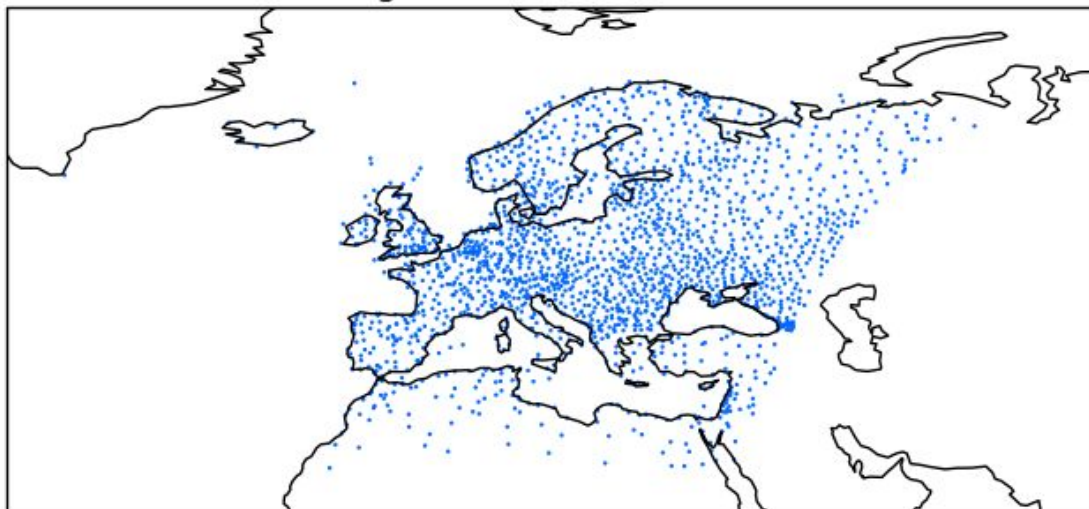


## Regional plots



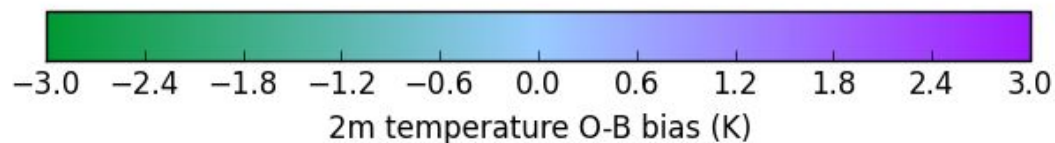
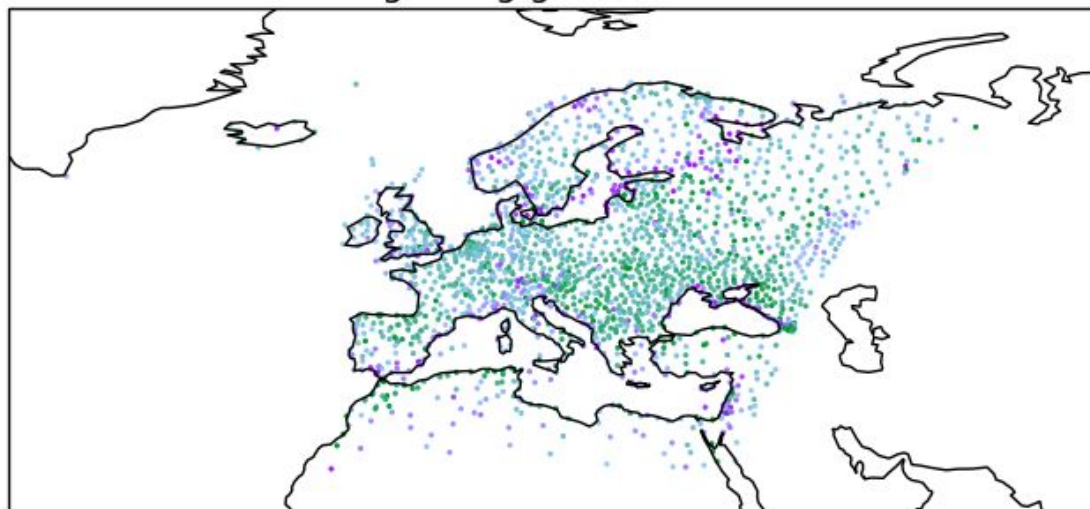
## Location plots

2037 SYNOP stations with 2m temperature reports  
during 01/05/79 until 01/06/79



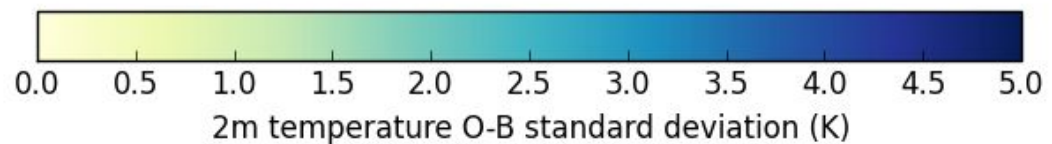
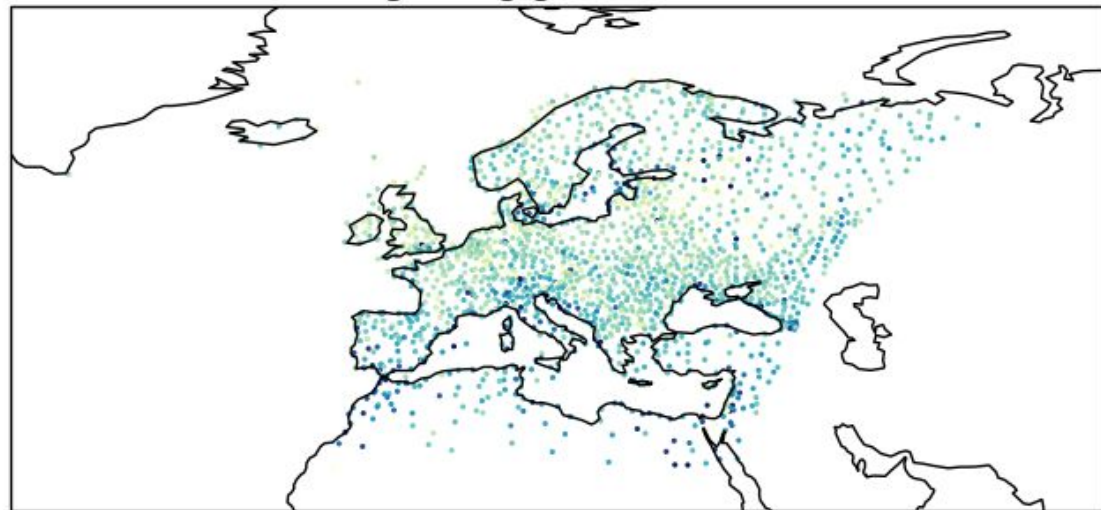
## Bias plots

O-B Bias for SYNOP stations with 2m temperature reports  
during 01/05/79 until 01/06/79  
ignoring gross errors

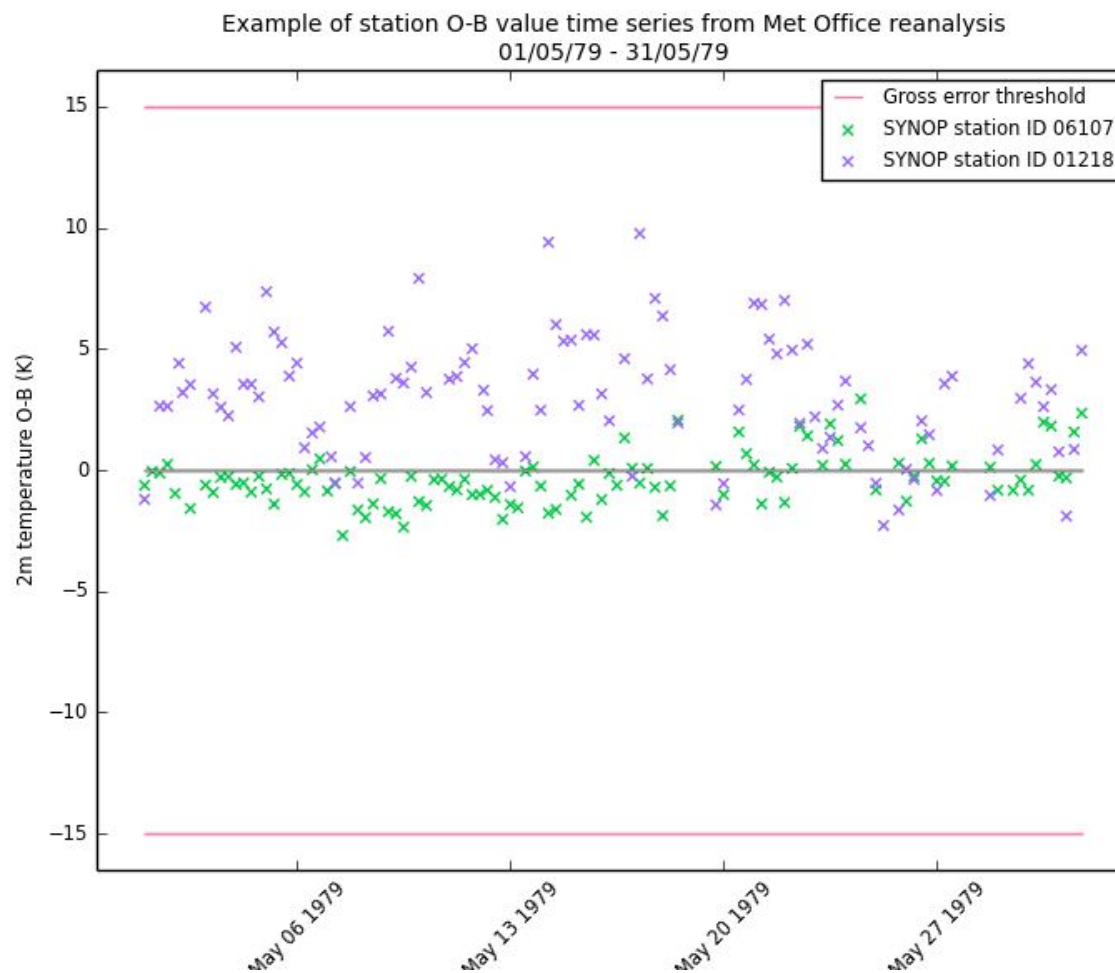


## Standard deviation plots

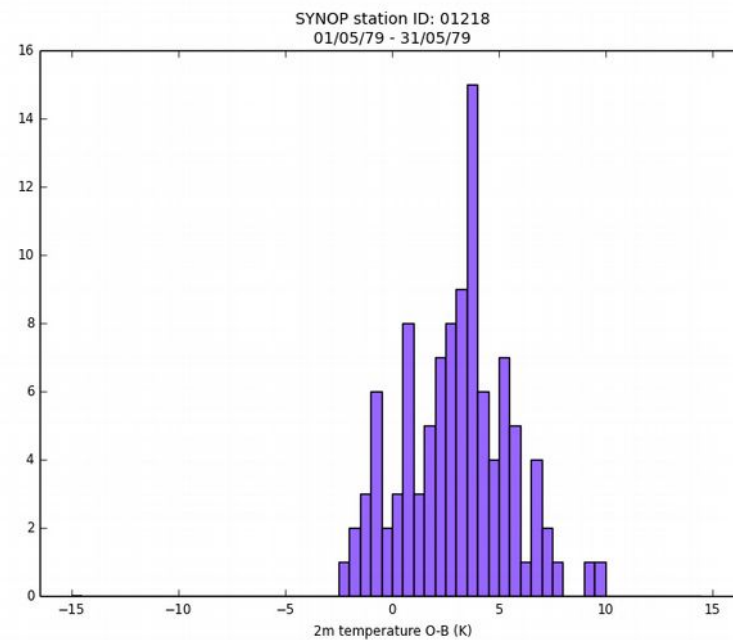
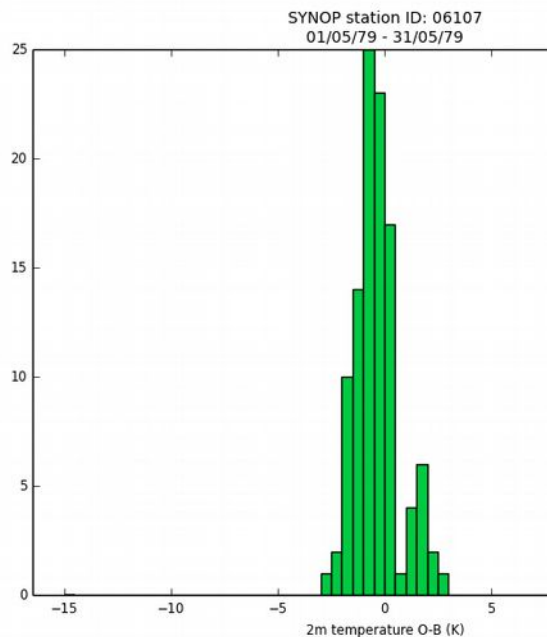
O-B Standard deviation for SYNOP stations with 2m temperature reports  
during 01/05/79 until 01/06/79  
ignoring gross errors



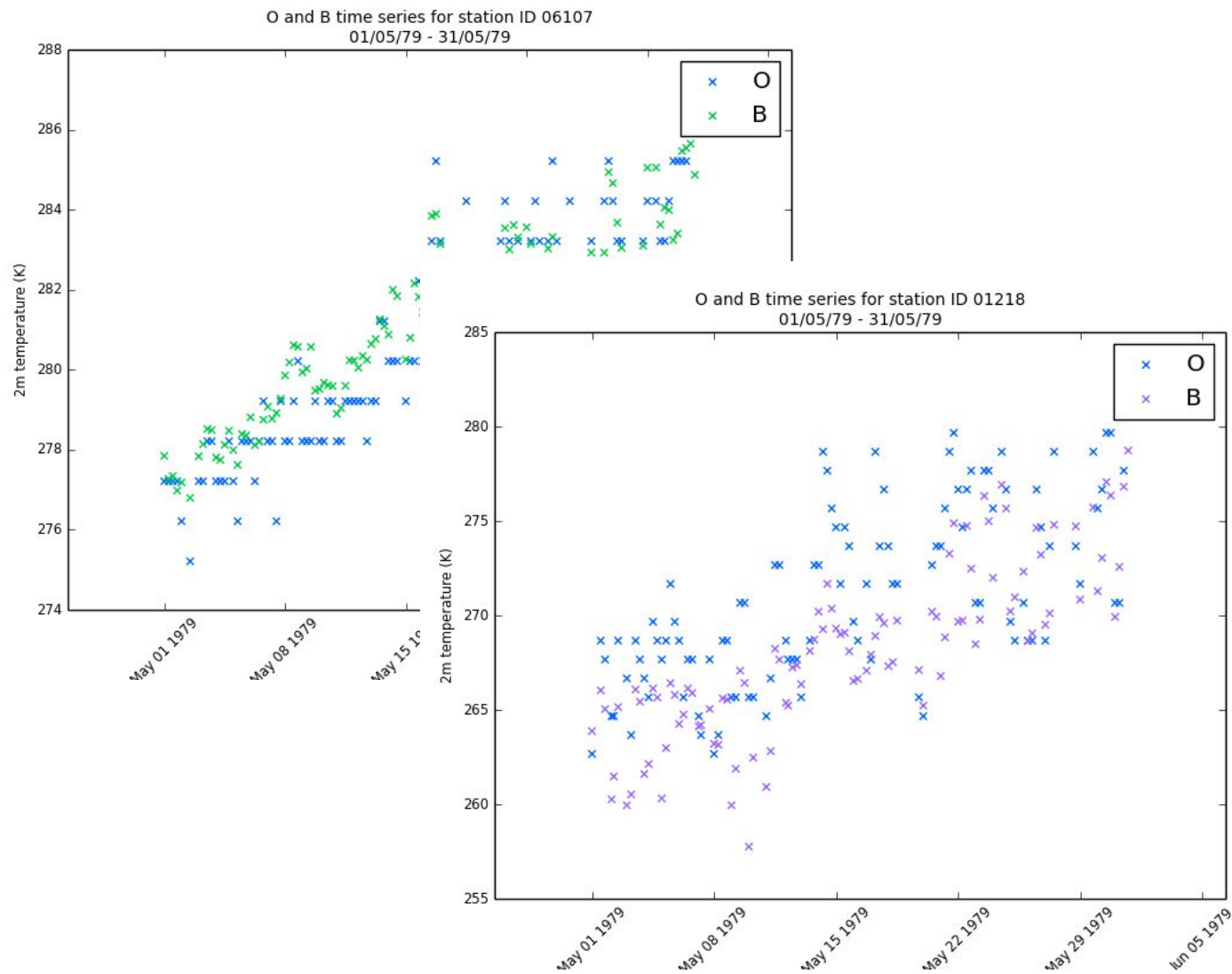
# Station plots



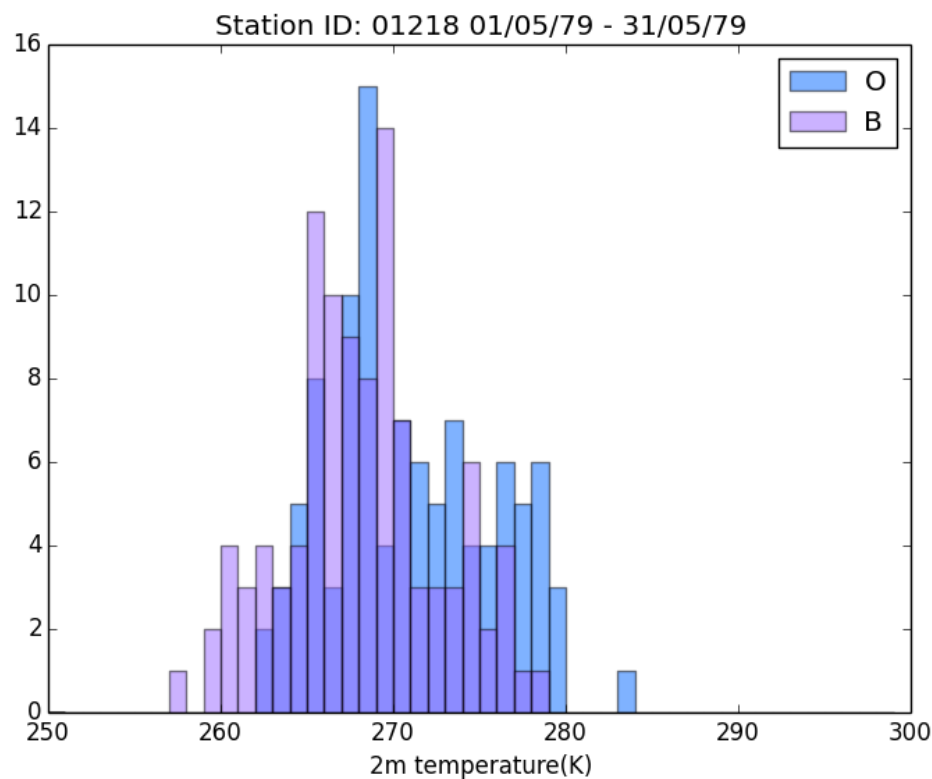
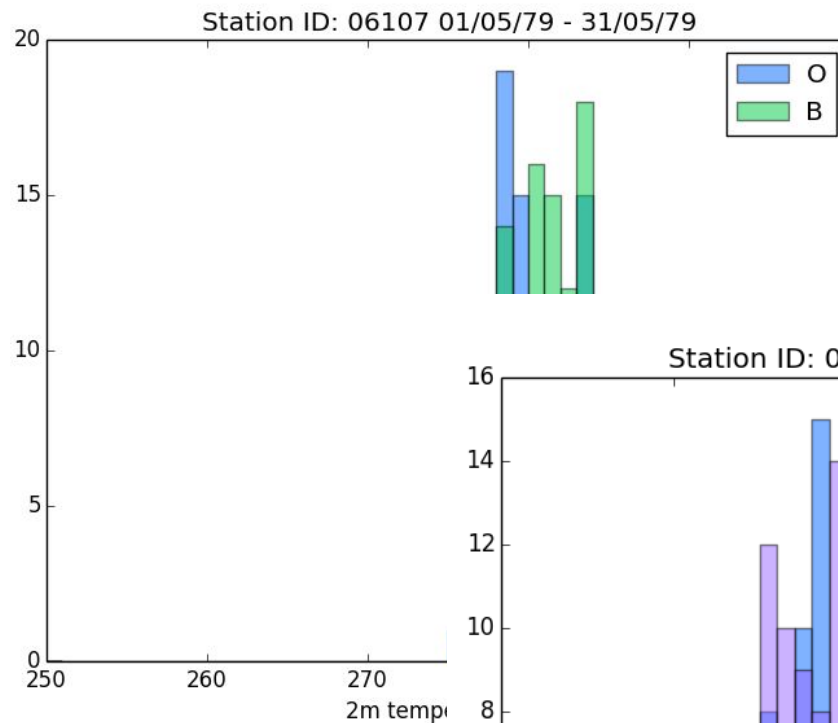
## Station plots



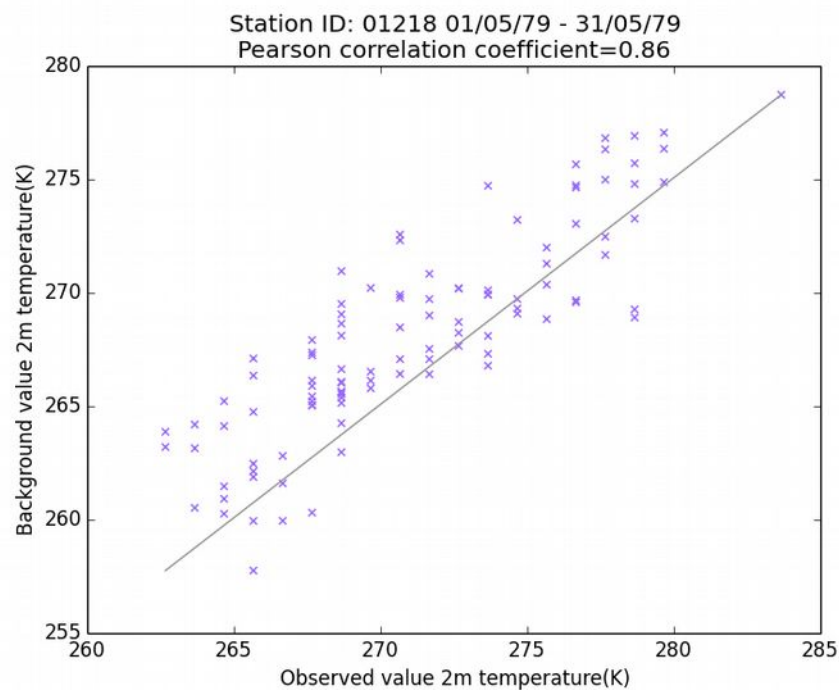
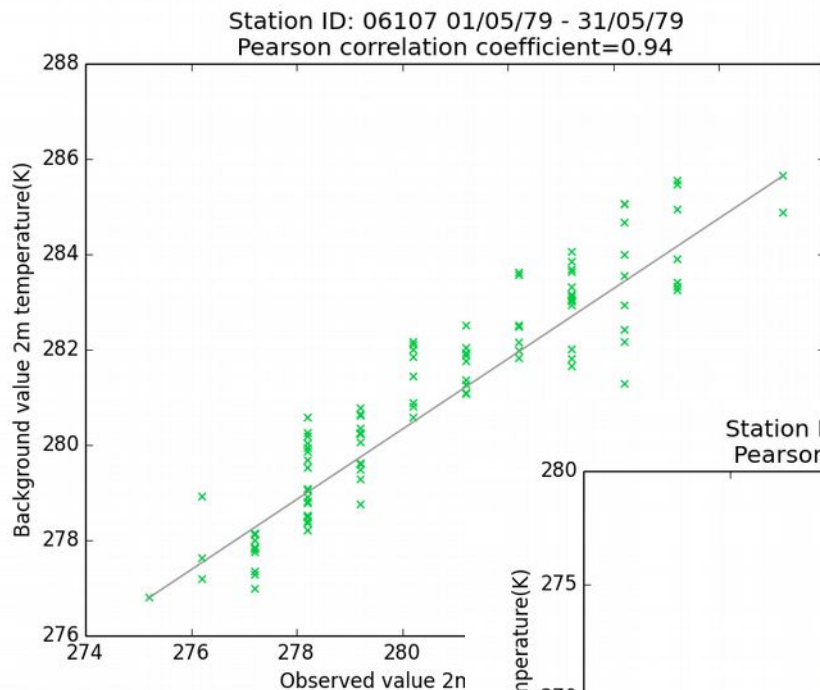
# Station plots



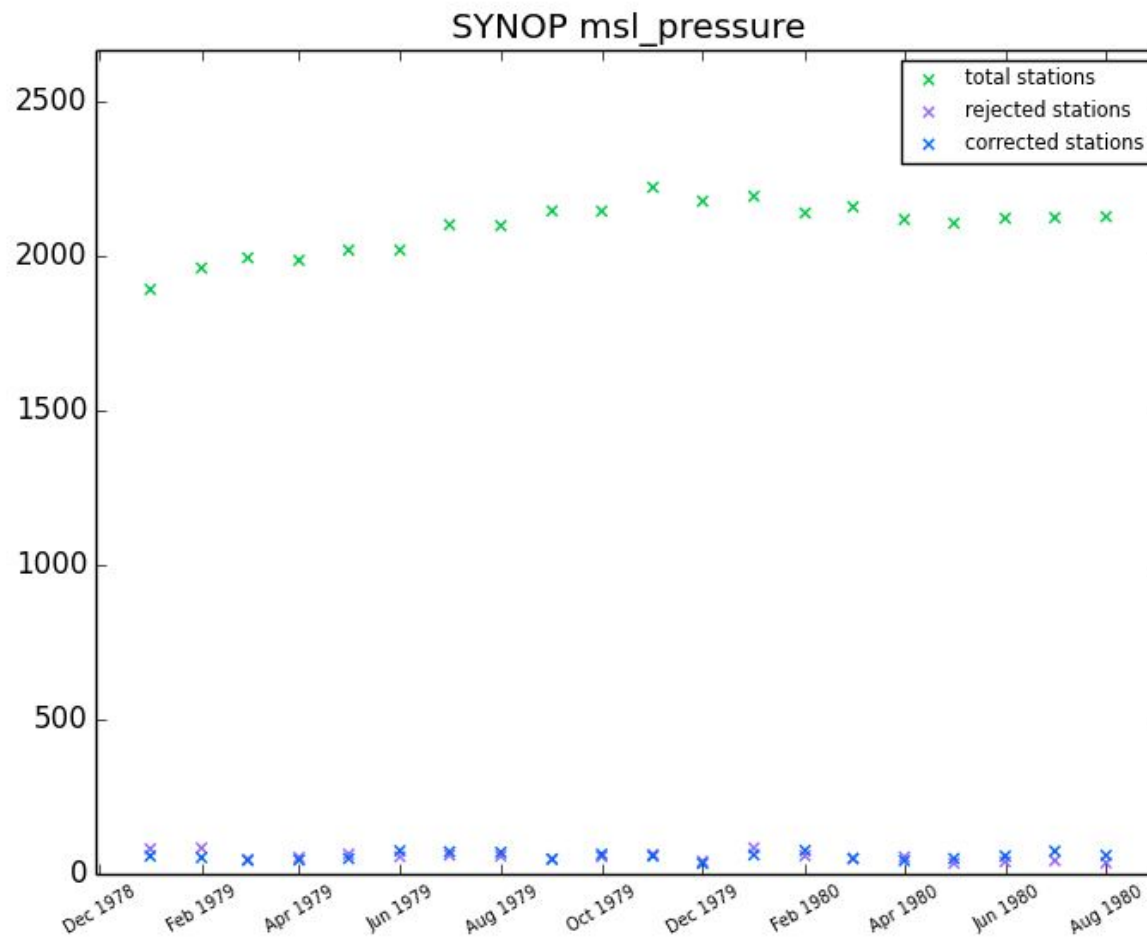
# Station plots



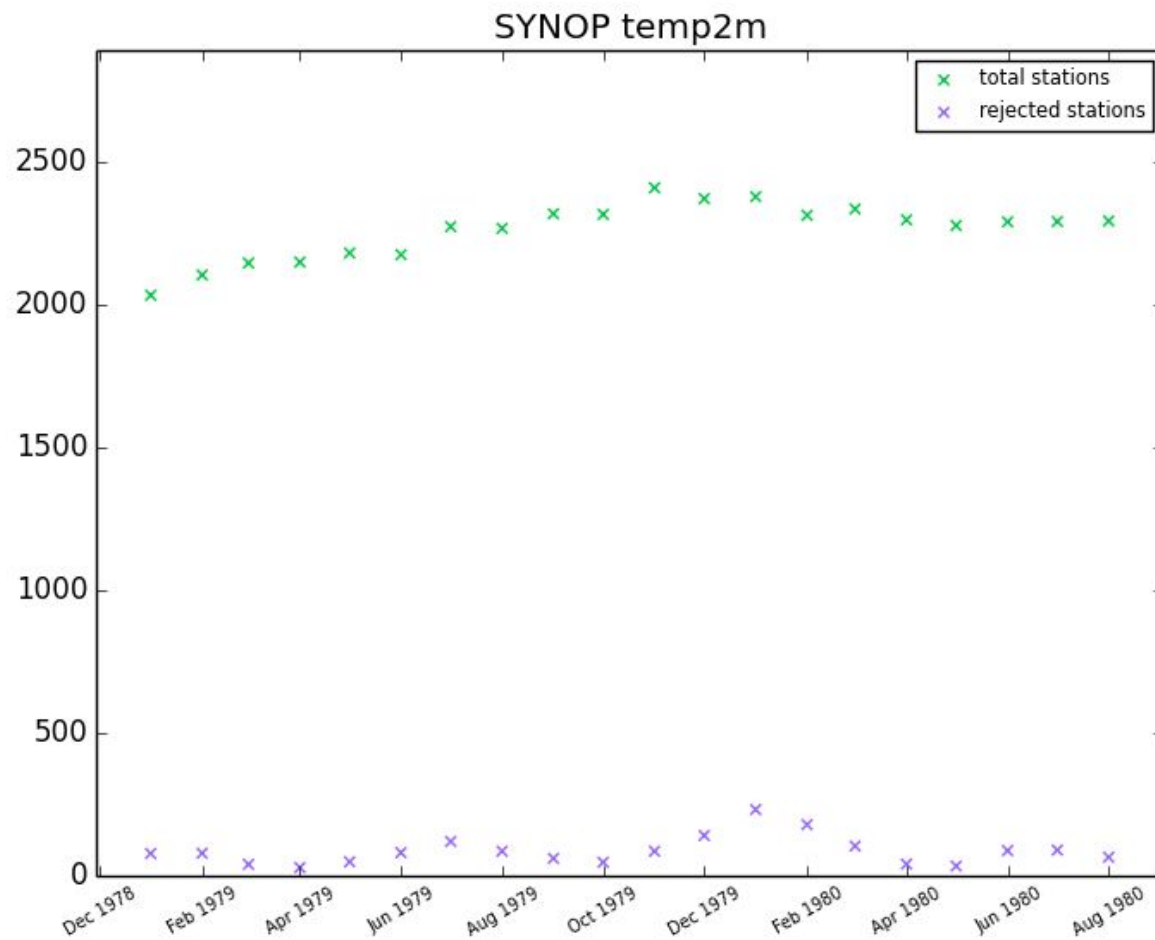
# Station plots



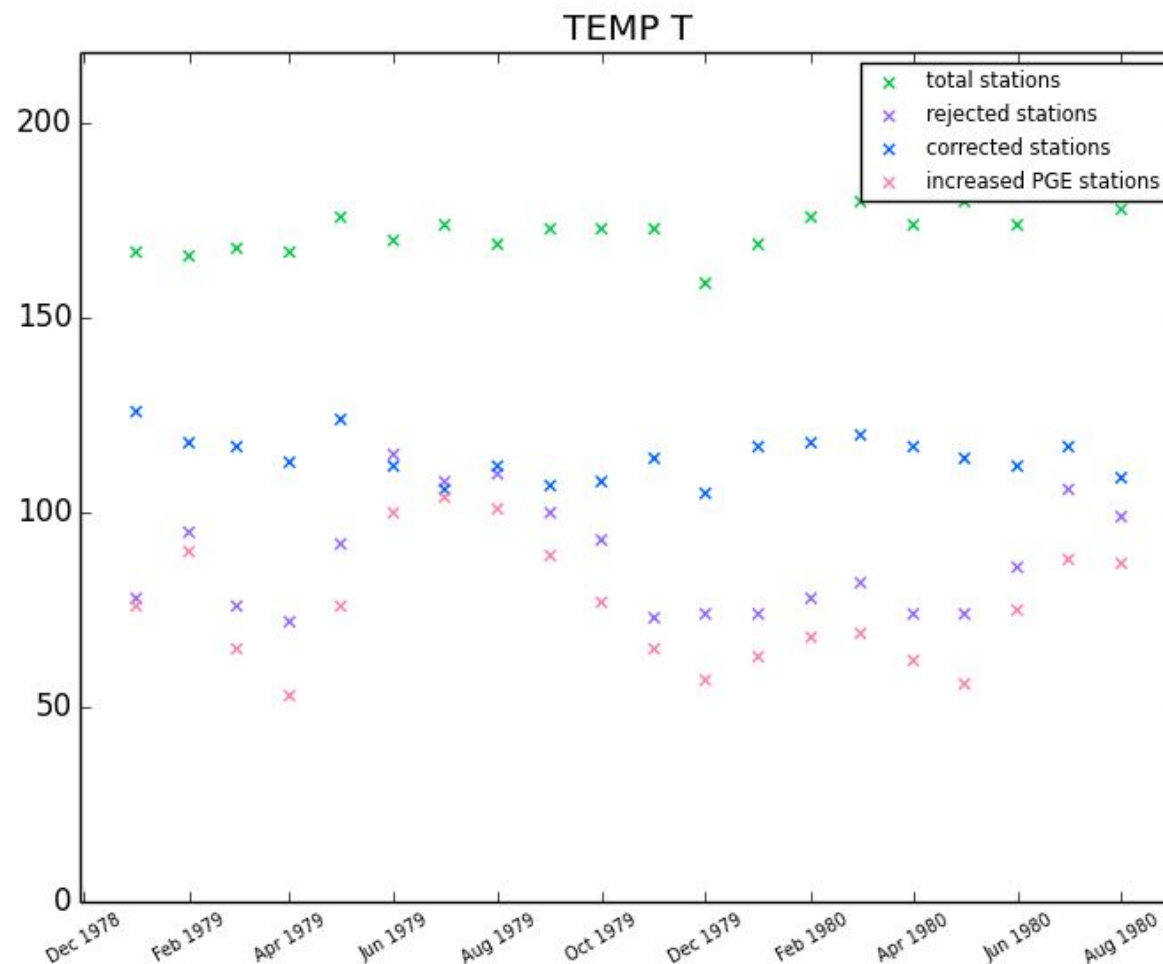
## Decision count plots



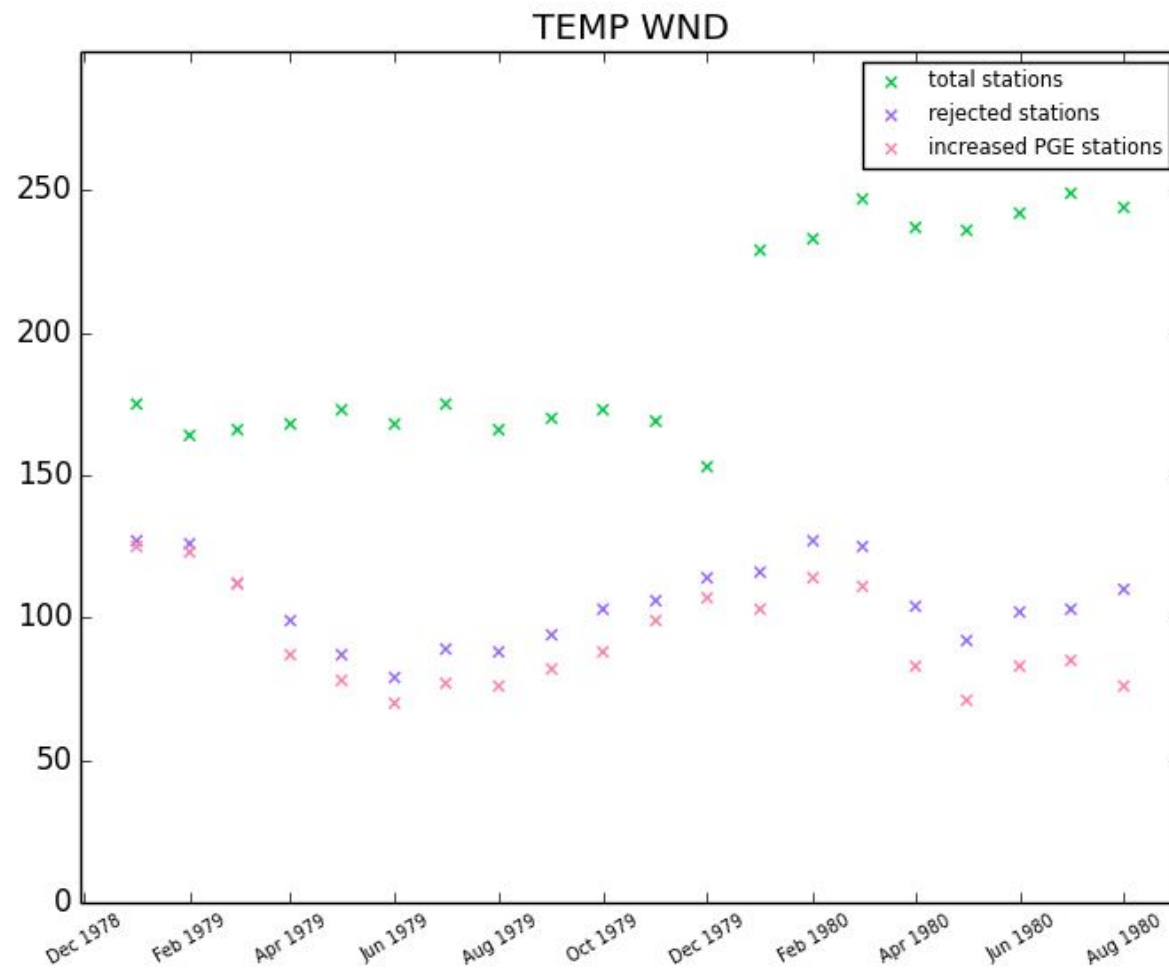
## Decision count plots



## Decision count plots

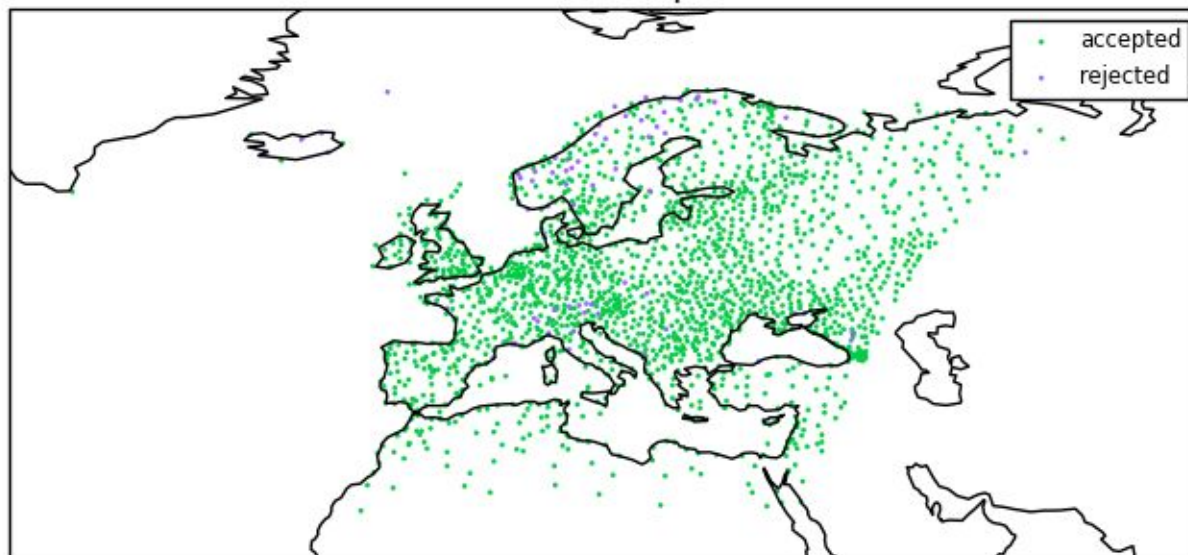


# Decision count plots



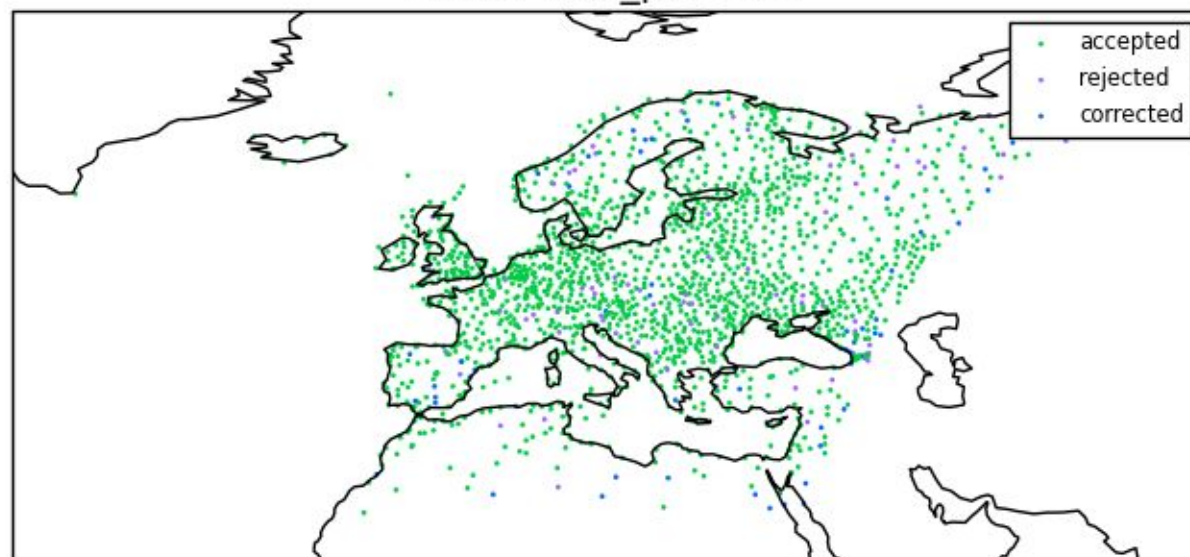
## Decision map plots

Decisions Plot (197901)  
SYNOP temp2m

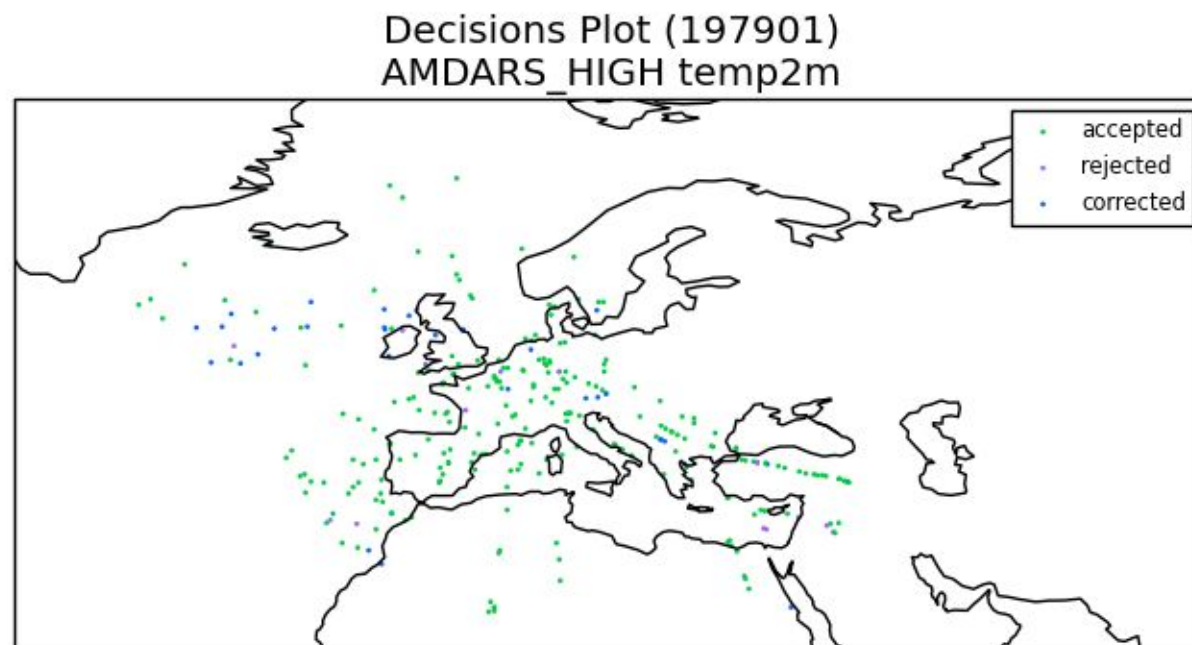


## Decision map plots

Decisions Plot (197901)  
SYNOP msl\_pressure

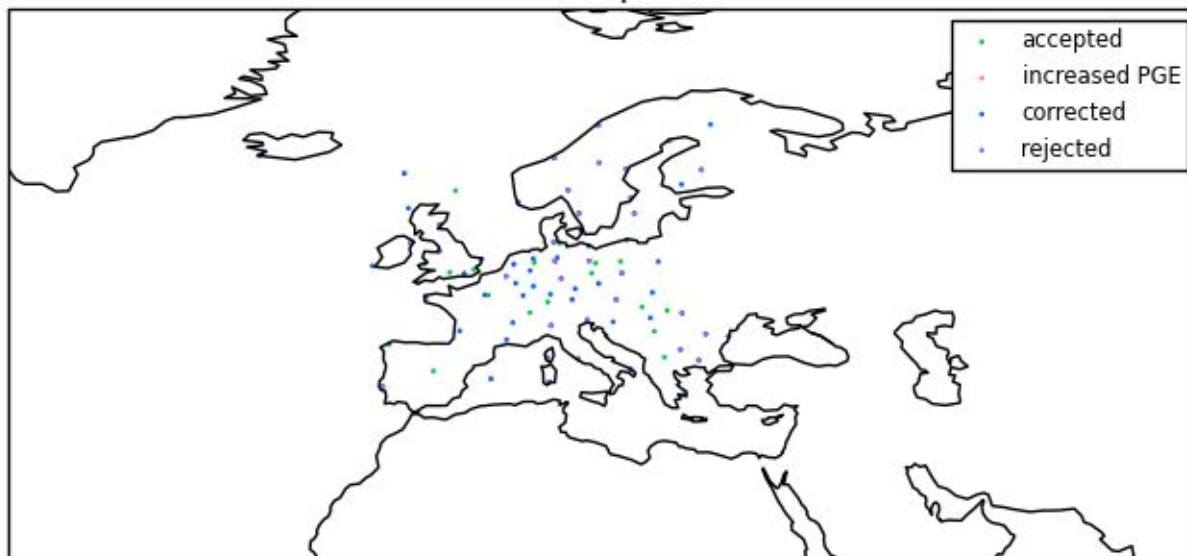


## Decision map plots



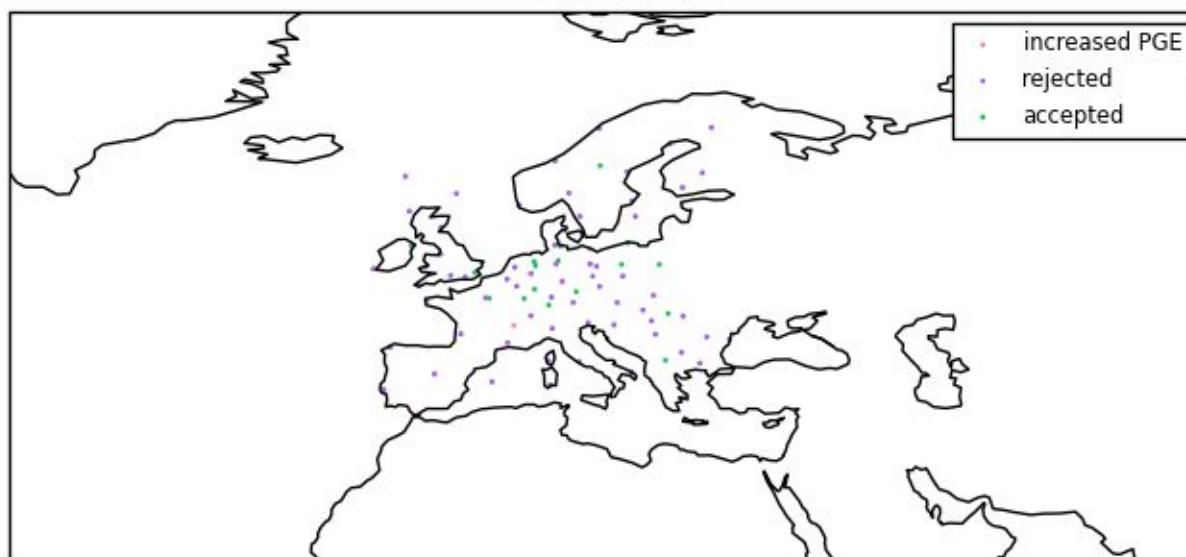
## Decision map plots

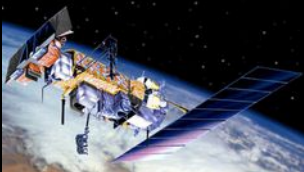
Decisions Plot (197901)  
TEMP Temperature



## Decision map plots

Decisions Plot (197901)  
TEMP Wind





# Variational Satellite Bias Correction

- Airmass-dependent bias correction of satellite radiances (based on Harris and Kelly, 2001)

$$bias = c^{scan} + \sum_{i=1}^n c_i^{air} f(x_b)$$

- VarBC will give smooth and automatic updating
- Predictor 850-300hPa thickness
- Allow a month spin-up for each instrument

## Data denial experiment

- With and without satellite data
- Time periods
- Uncertainty, means, variability and trends
- Which fields are satellite data most important for?
- Does the impact vary based on time of year, time of day, region?
- Compare with FSOI
- Impact on metrics used for verification of reanalysis
- Potential implications of results

## Other related future work

- Impact of not updating station lists
- How is the uncertainty affected by changes in the observing network



Met Office

Any questions?