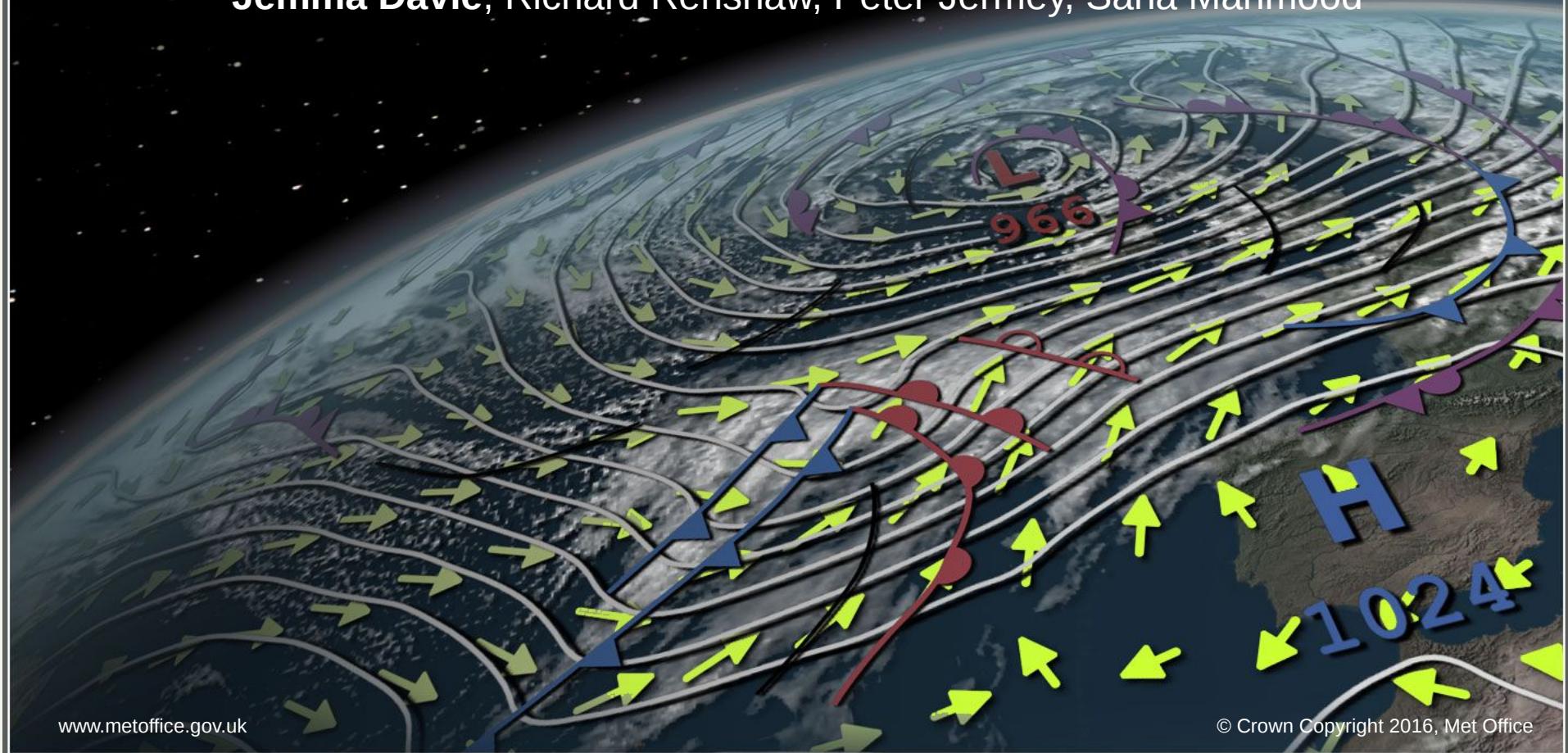


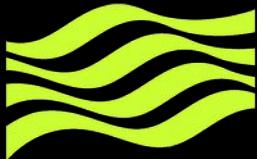


Met Office

Use of observations in Met Office reanalysis

Jemma Davie, Richard Renshaw, Peter Jermey, Sana Mahmood

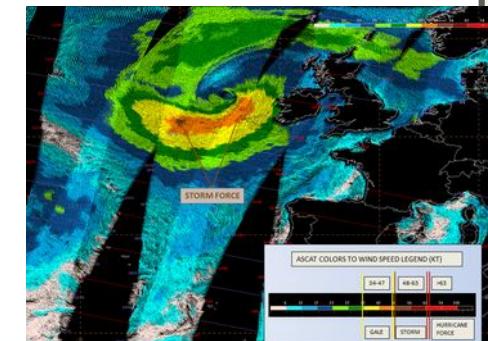




Met Office

Observations being used

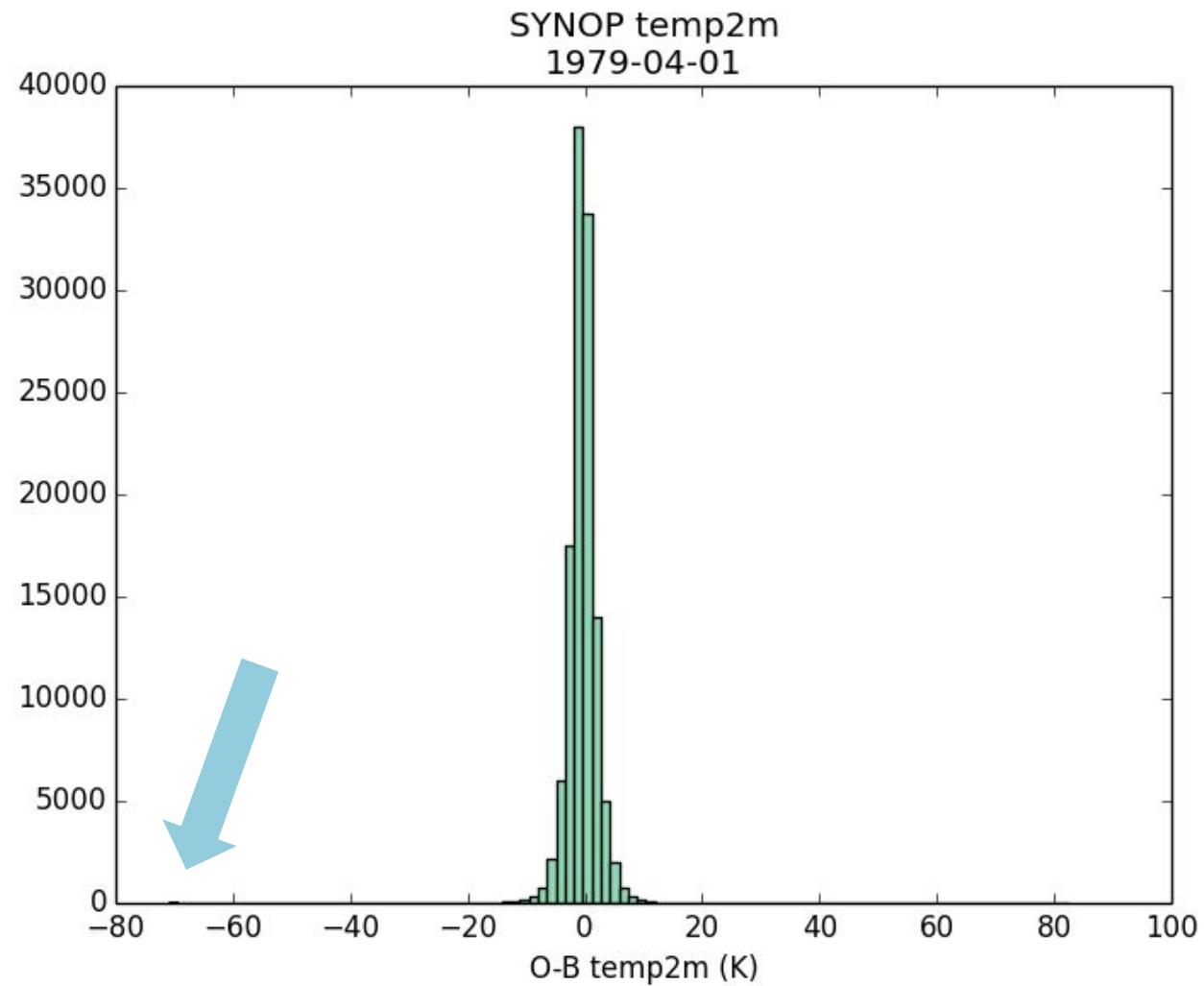
- Conventional Observations from the ECMWF archive
- Satellite Radiances (level 1b) – at least TOVS, ATOVS, AIRS, IASI from ECMWF
- Reprocessed (consistent) satwinds – EUMETSAT & CIMSS
- Reprocessed (consistent) scatterometer winds – KNMI (Ocean SAF)
- Reprocessed (consistent) GPSRO - UCAR
- Reprocessed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





Met Office

Regional plots

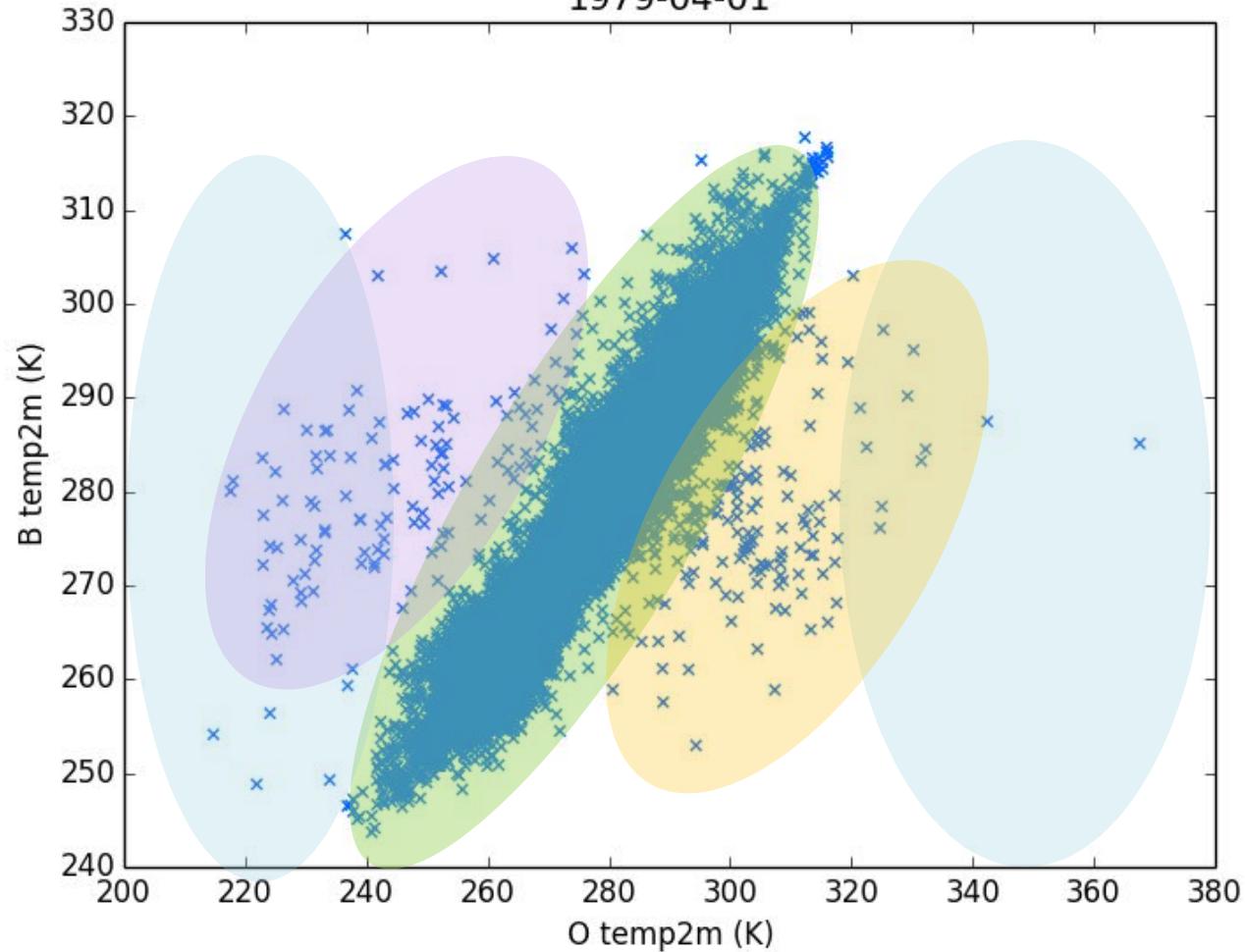




Met Office

Regional plots

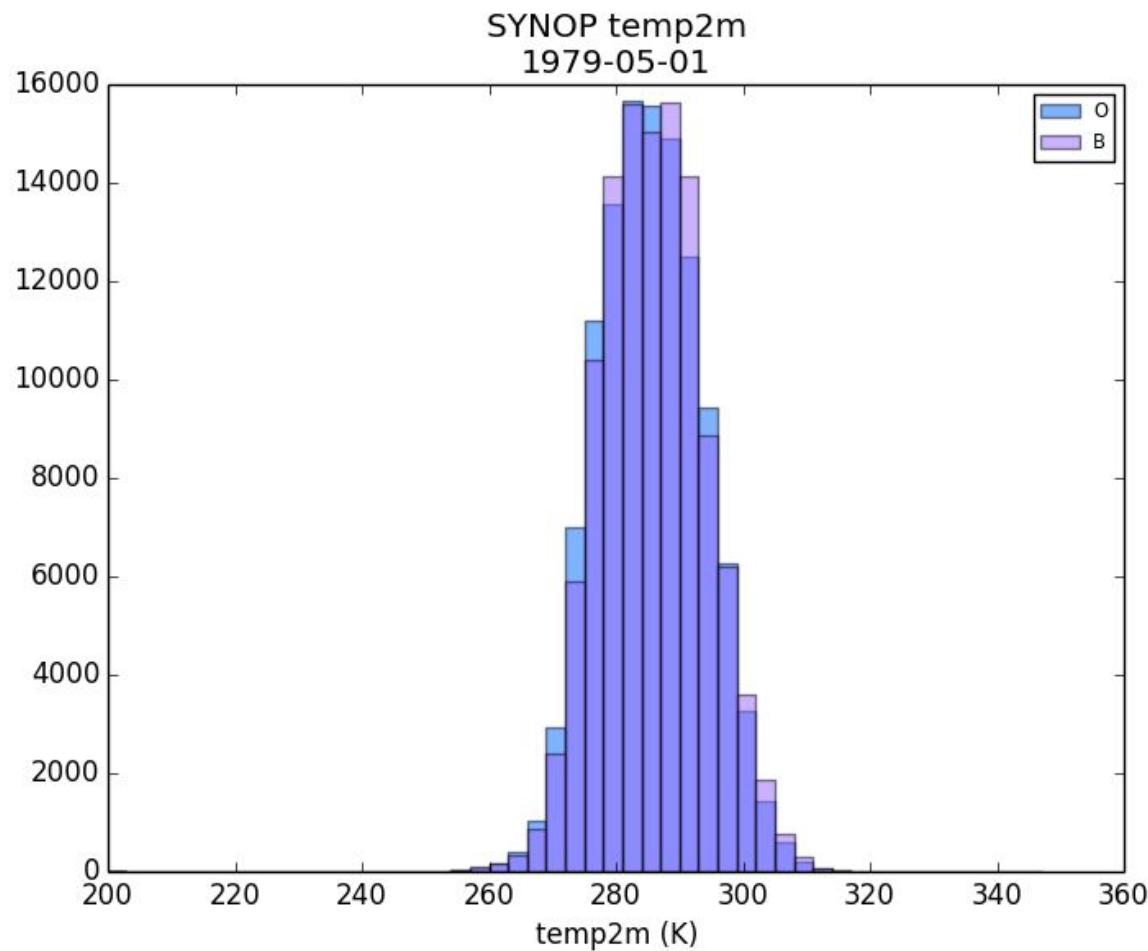
SYNOP temp2m
1979-04-01

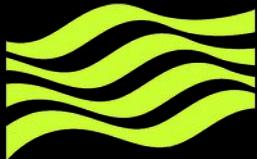




Met Office

Regional plots

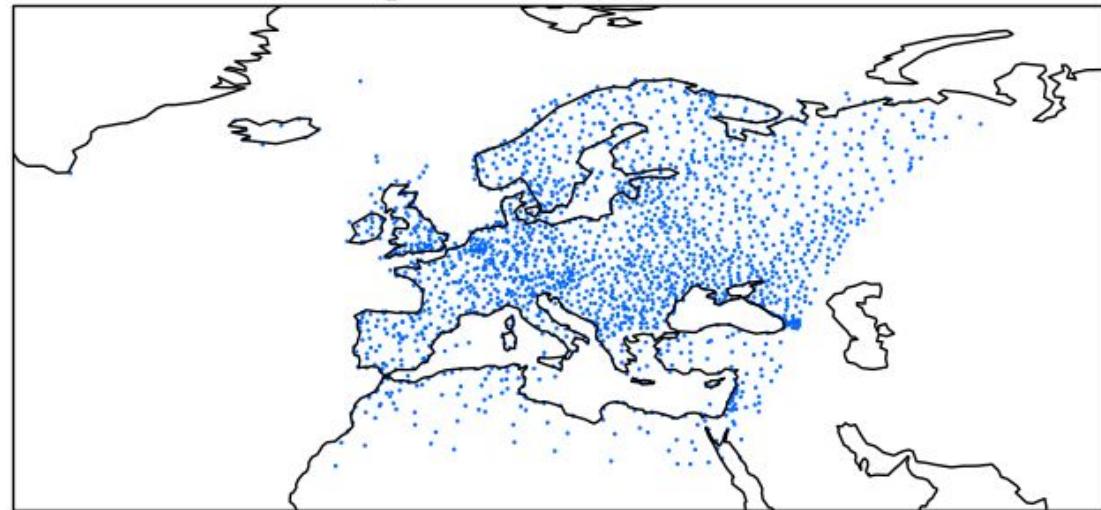




Met Office

Location plots

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

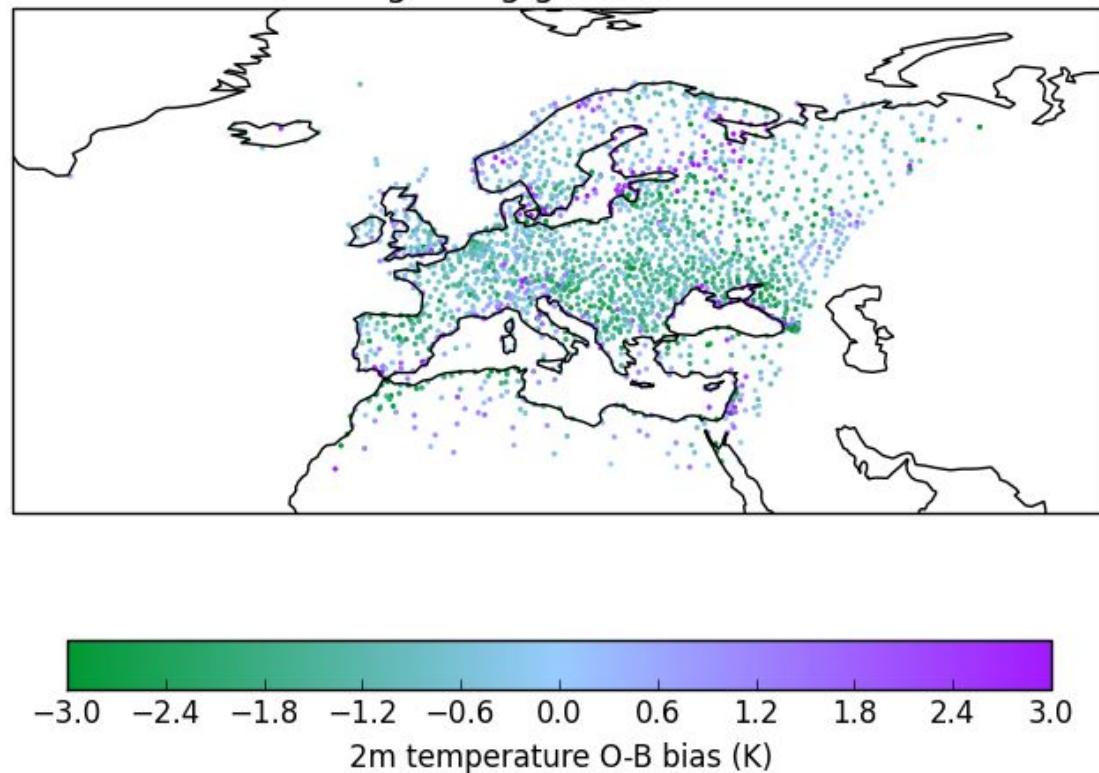




Met Office

Bias plots

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

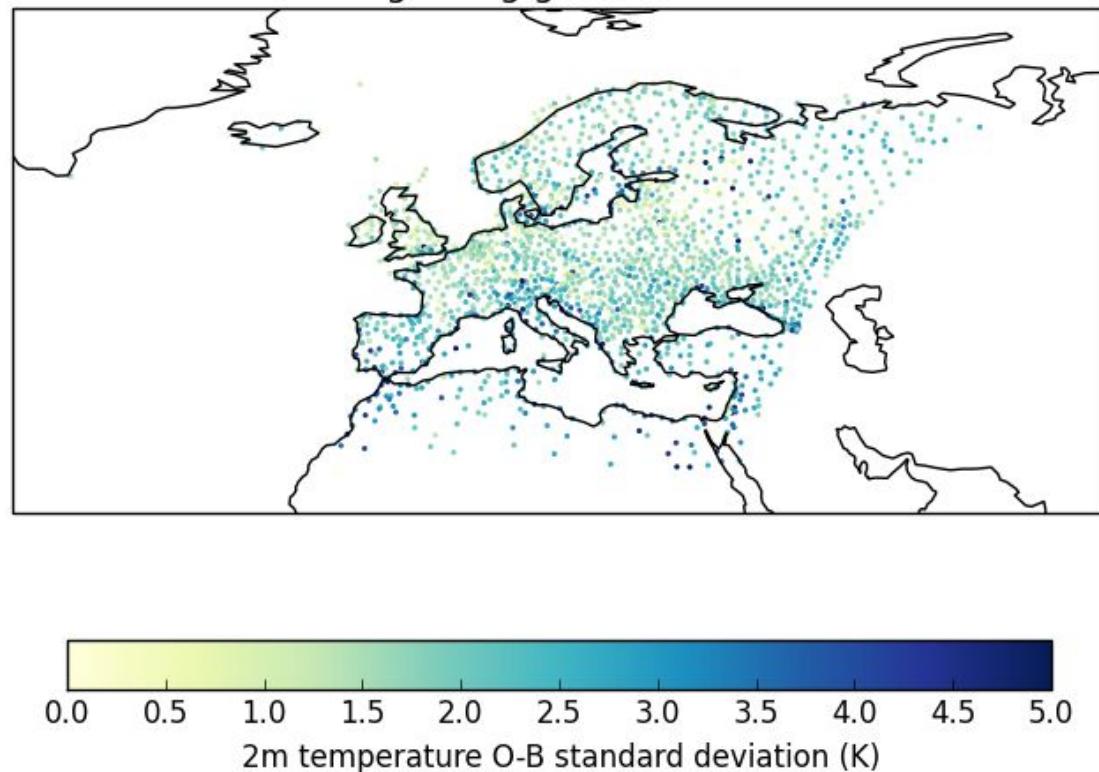




Met Office

Standard deviation plots

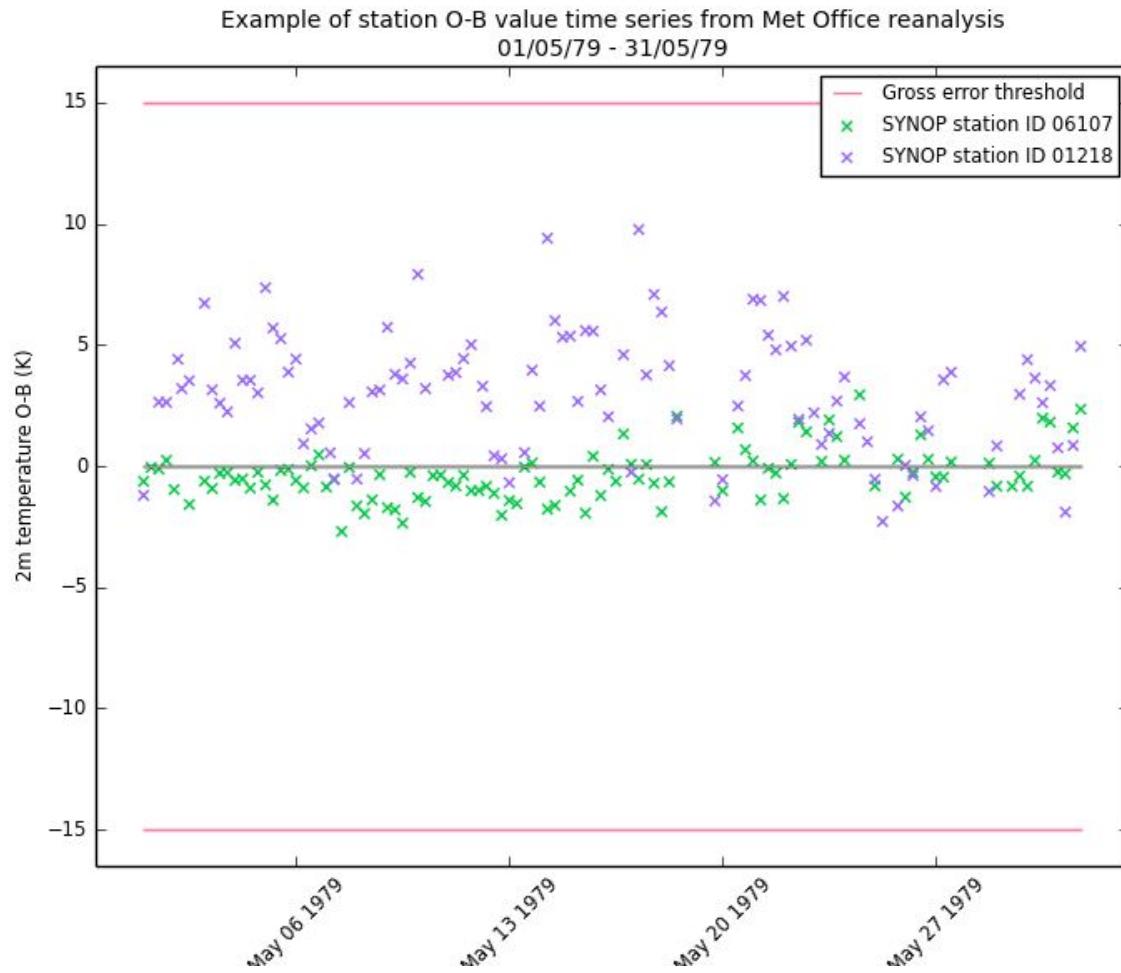
O-B Standard deviation for SYNOP stations with 2m temperature reports
during 01/05/79 until 01/06/79
ignoring gross errors





Met Office

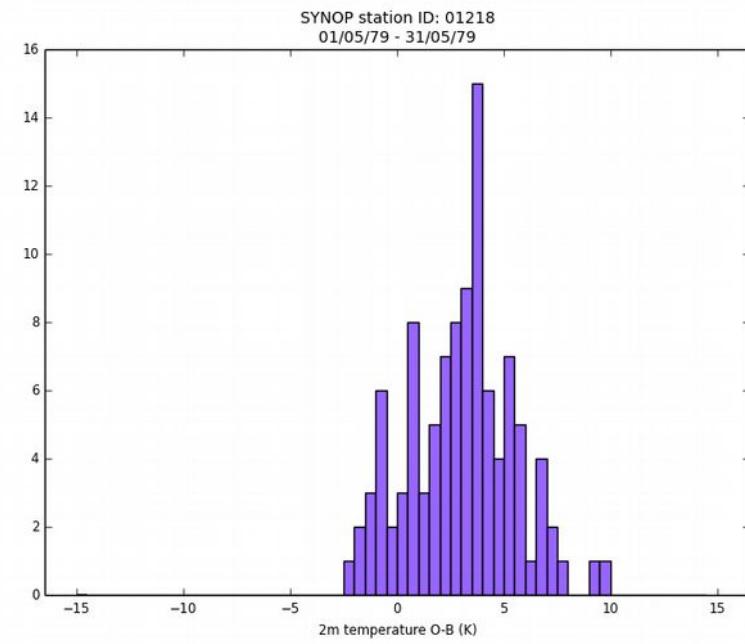
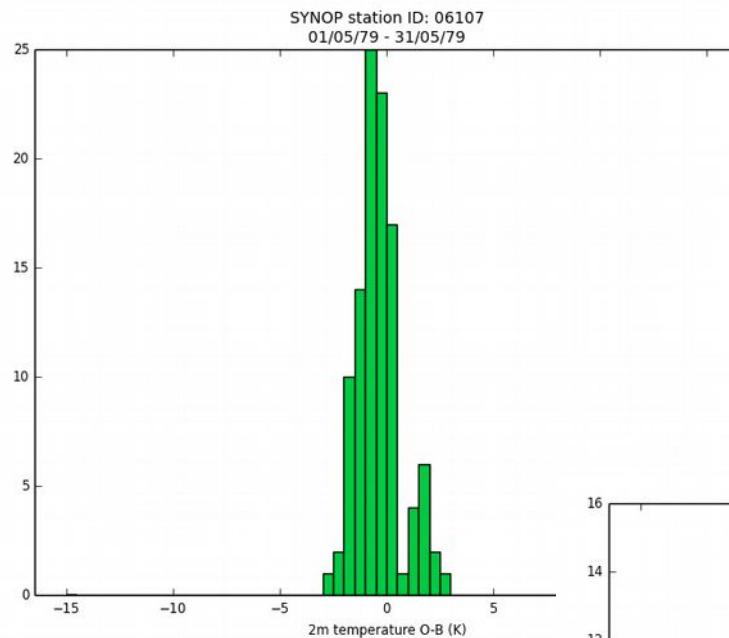
Station plots





Met Office

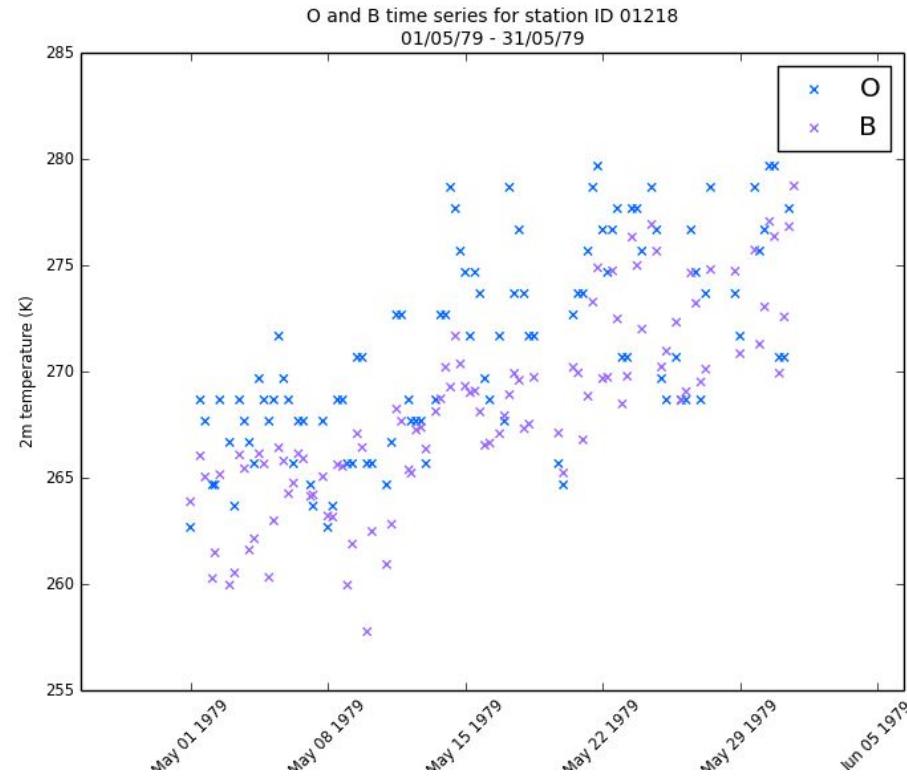
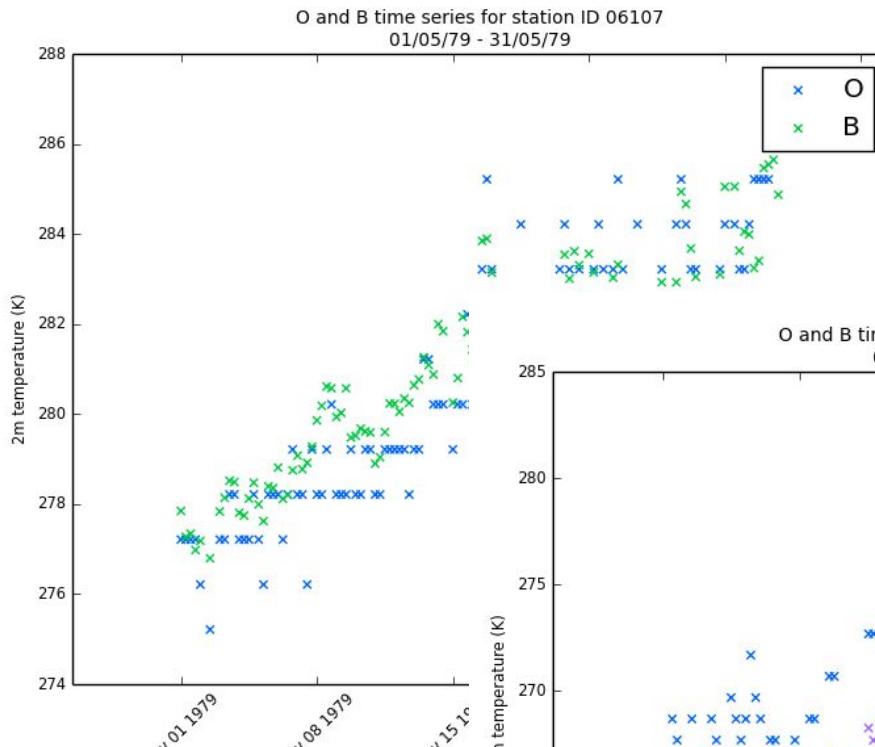
Station plots

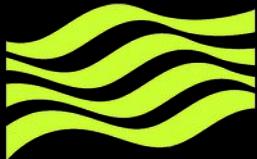




Met Office

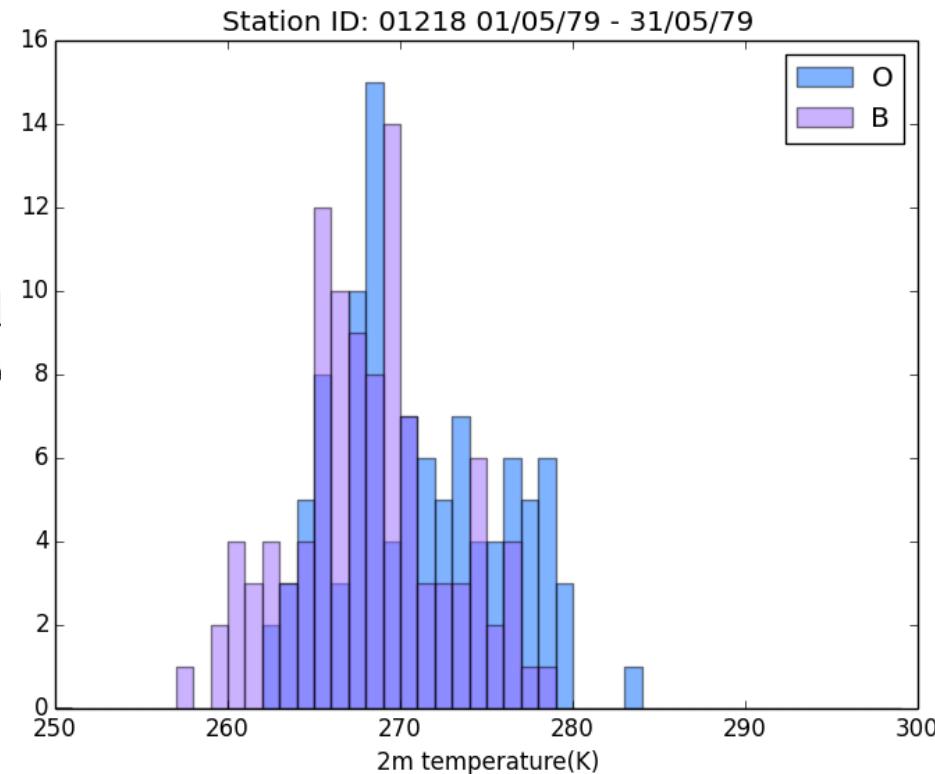
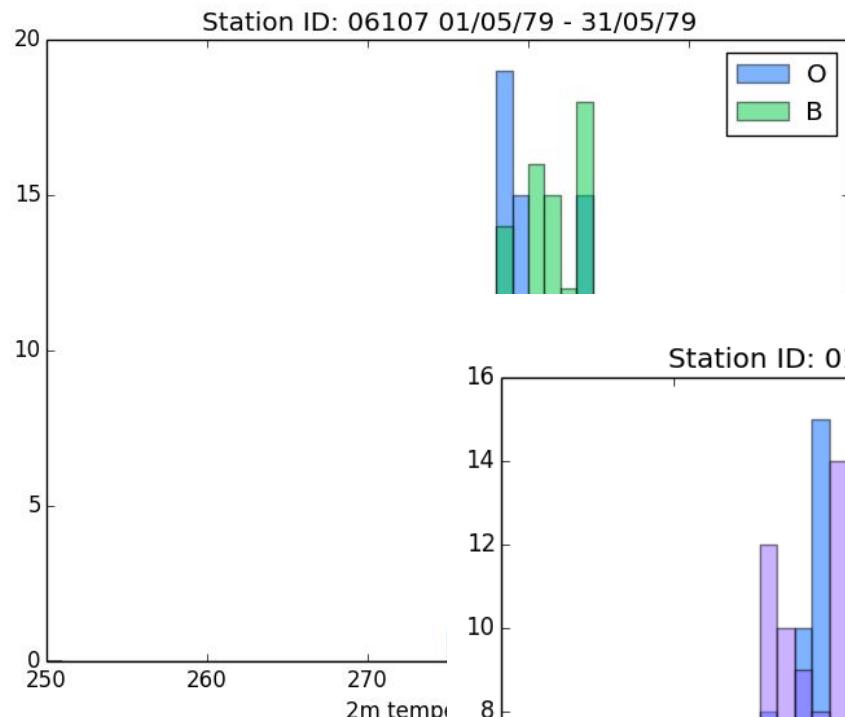
Station plots





Met Office

Station plots

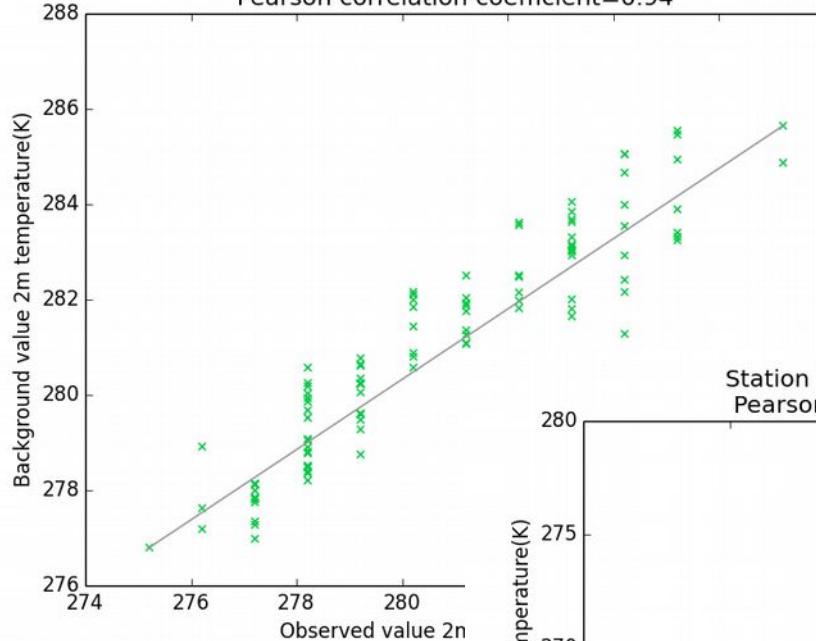




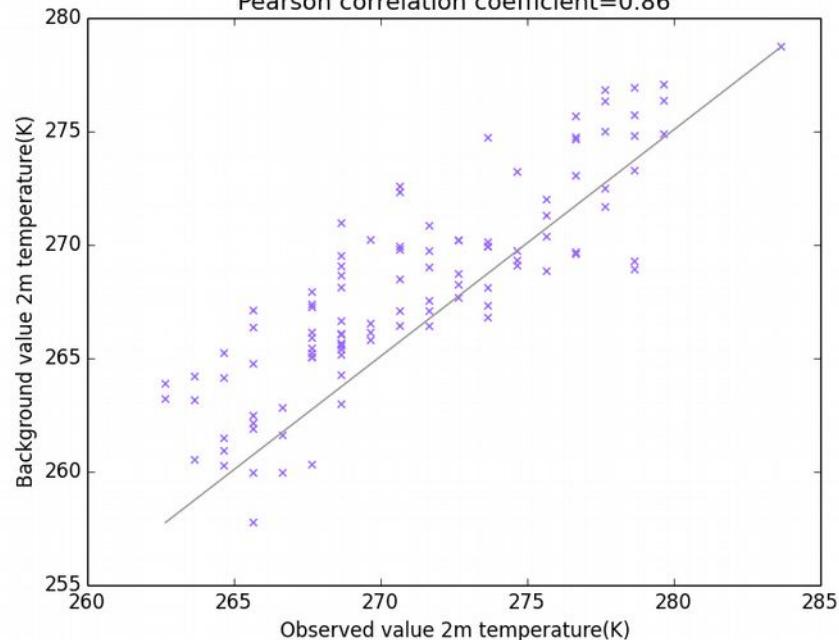
Met Office

Station plots

Station ID: 06107 01/05/79 - 31/05/79
Pearson correlation coefficient=0.94



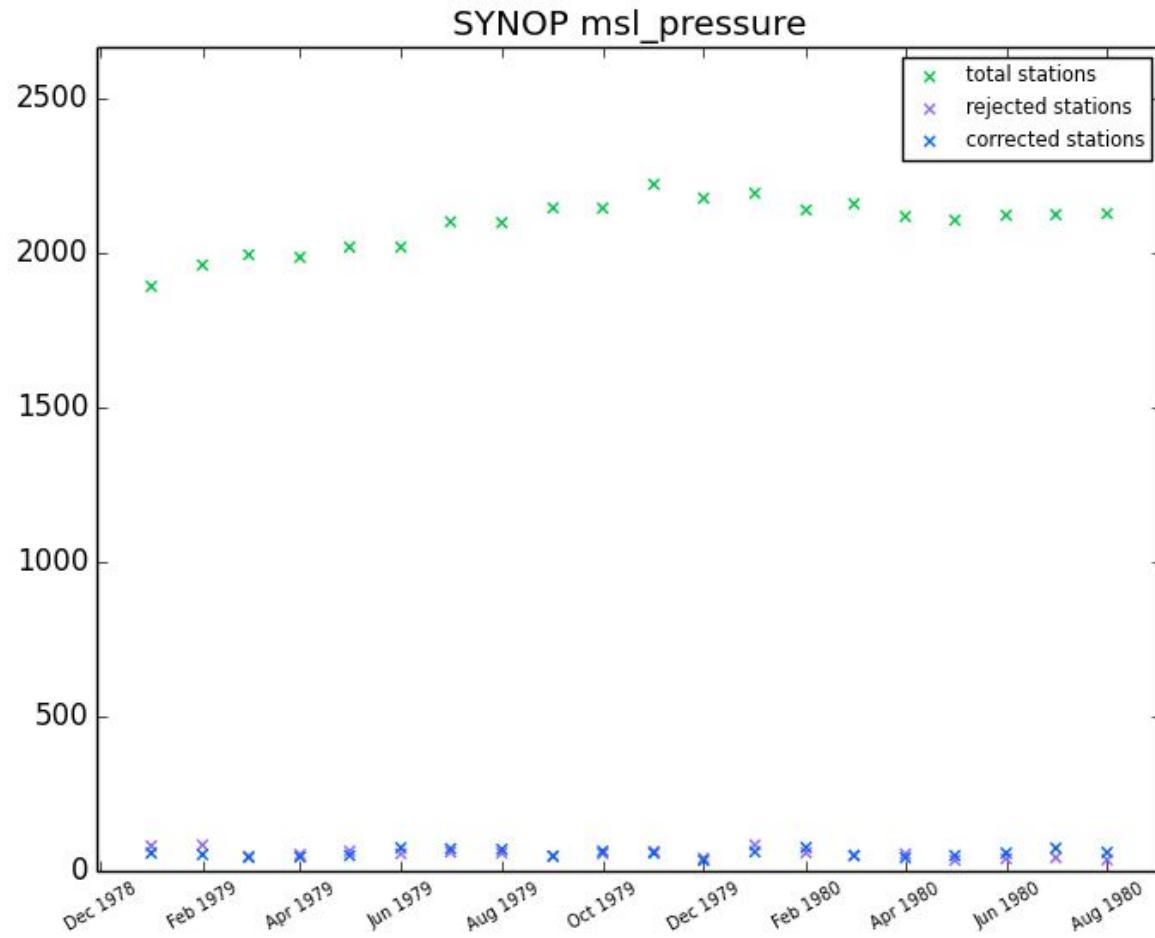
Station ID: 01218 01/05/79 - 31/05/79
Pearson correlation coefficient=0.86





Met Office

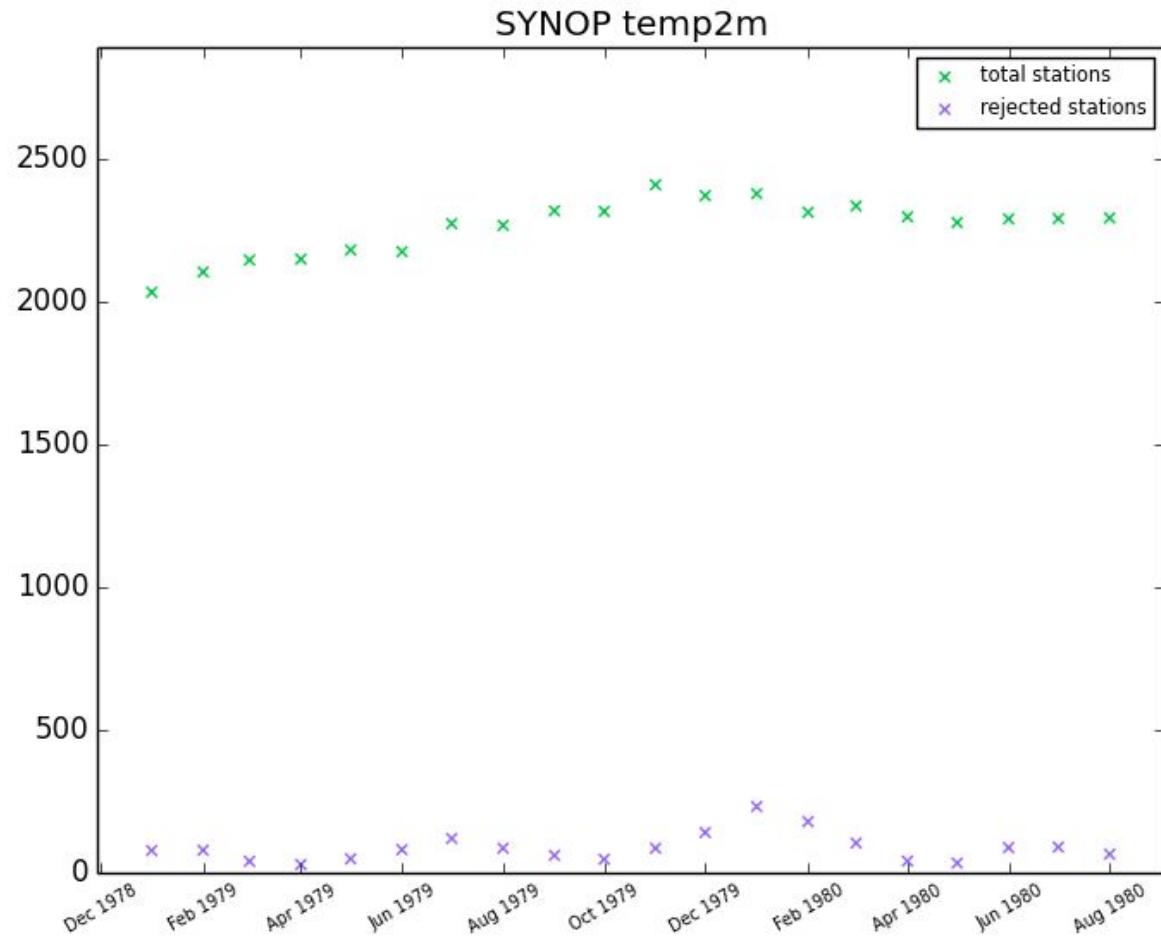
Decision count plots

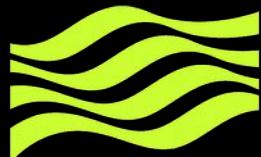




Met Office

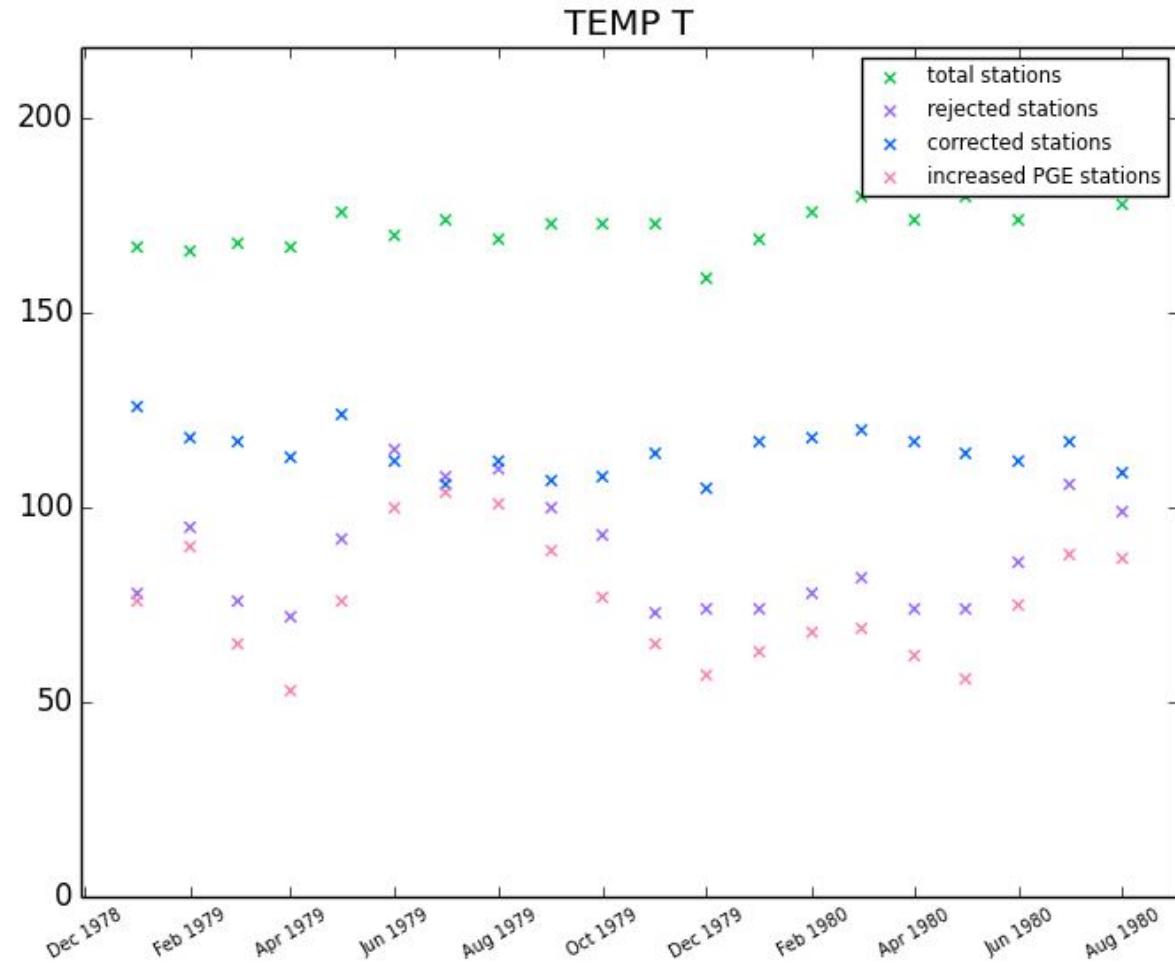
Decision count plots

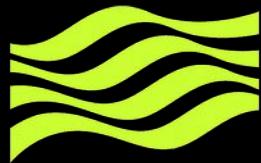




Met Office

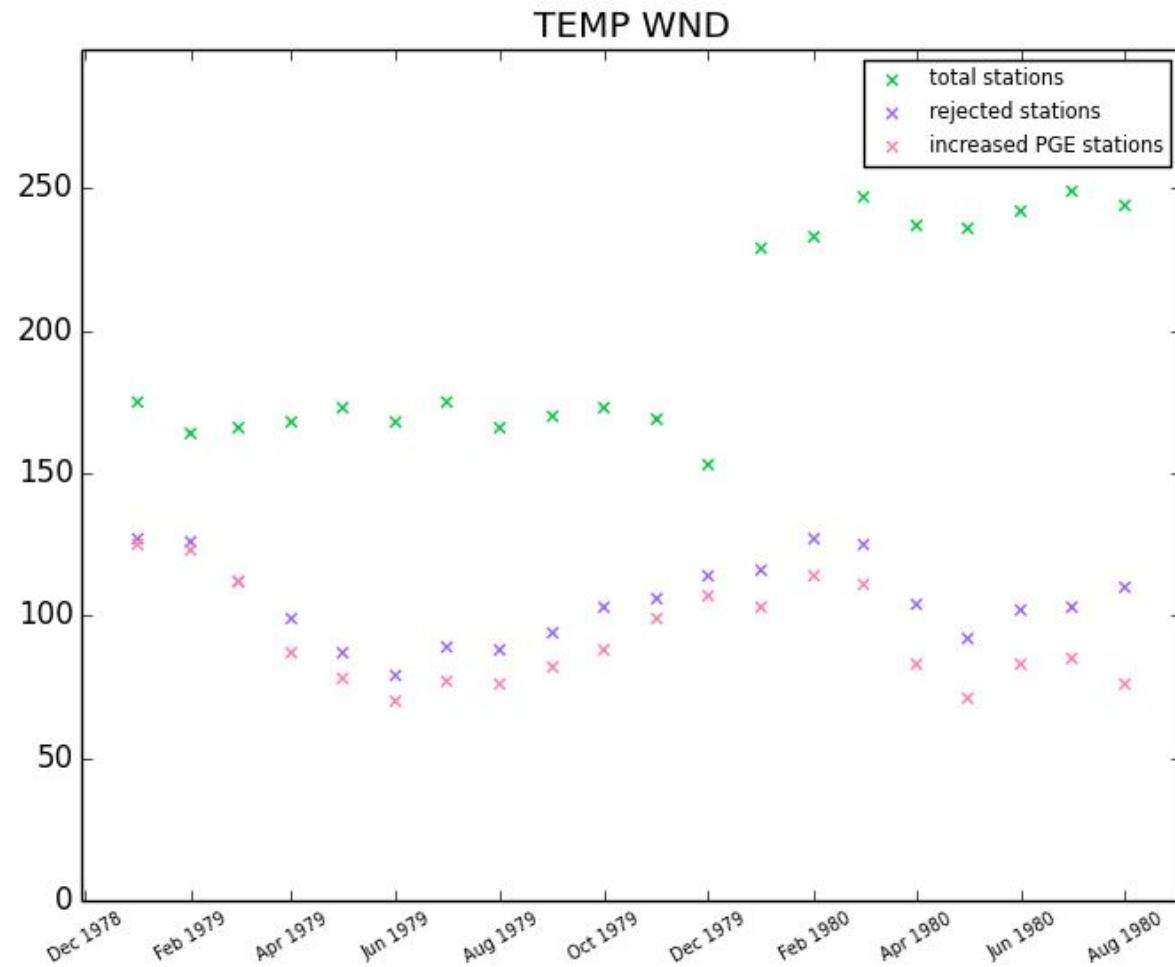
Decision count plots

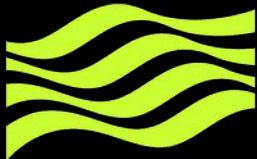




Met Office

Decision count plots

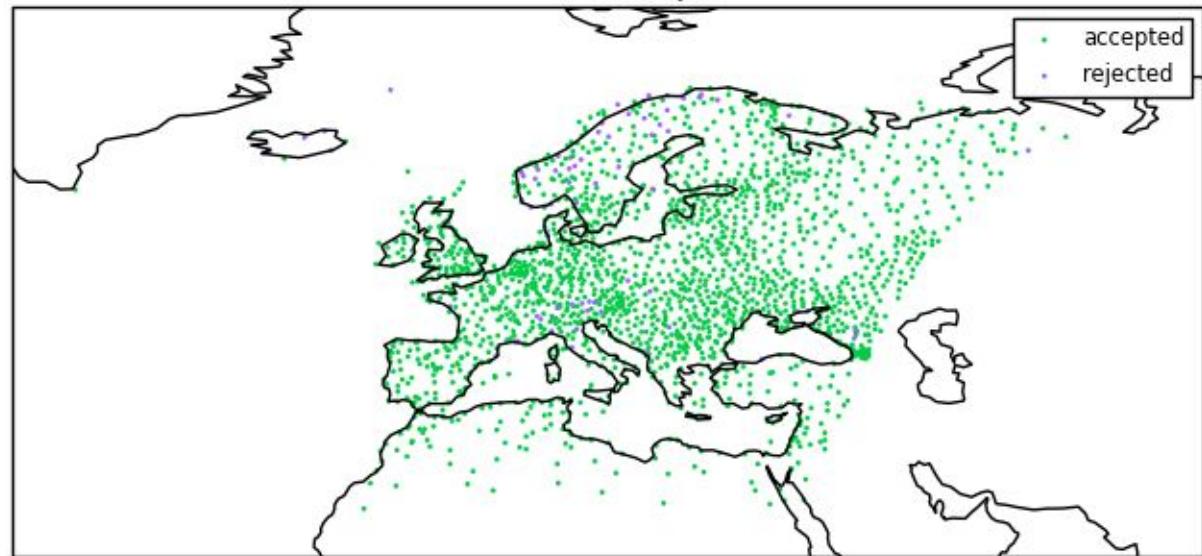




Met Office

Decision map plots

Decisions Plot (197901)
SYNOP temp2m

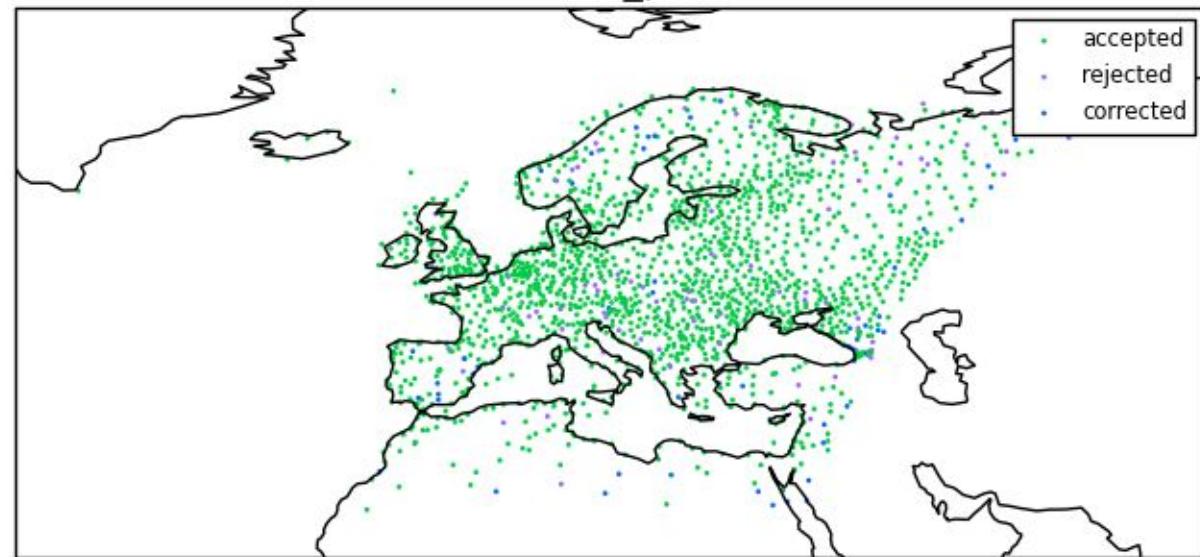




Met Office

Decision map plots

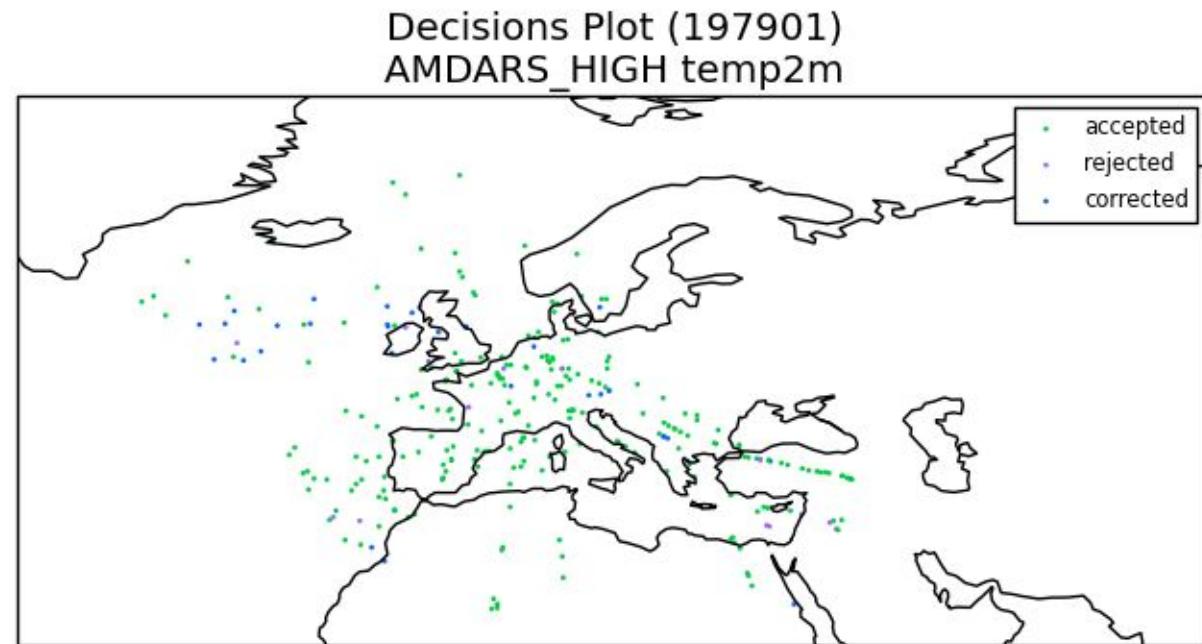
Decisions Plot (197901)
SYNOP msl_pressure





Met Office

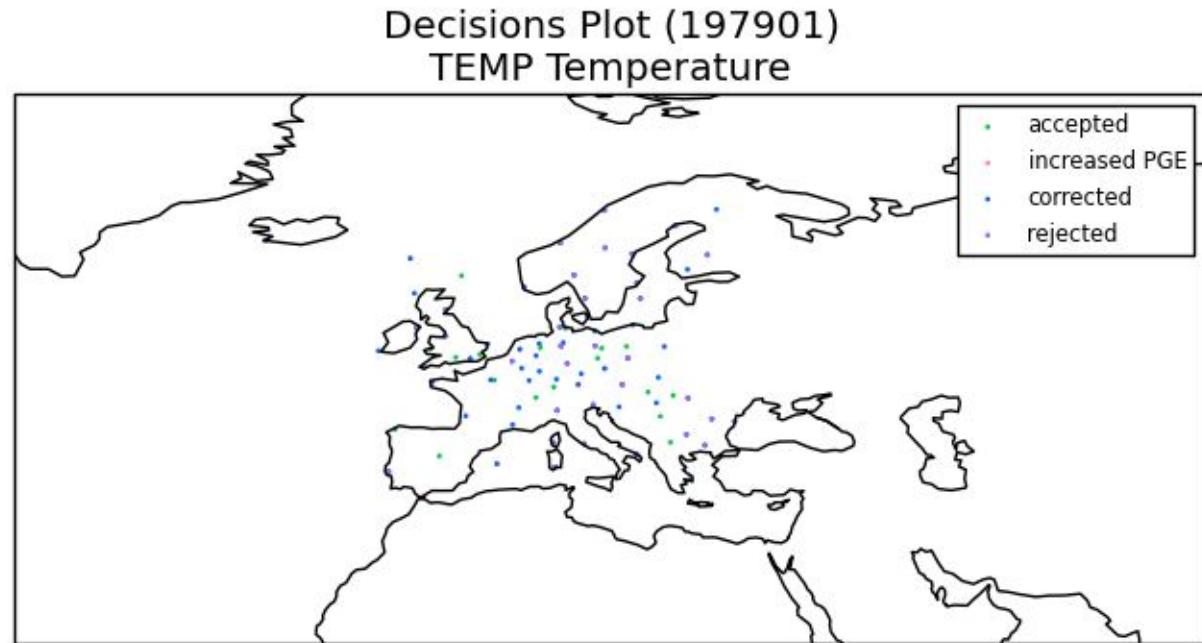
Decision map plots





Met Office

Decision map plots

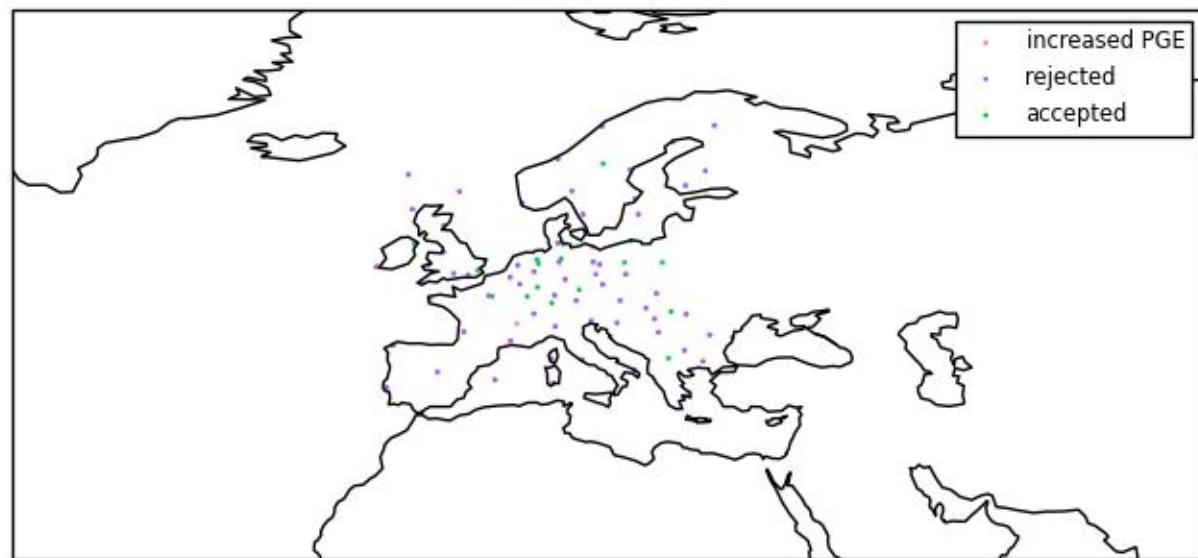




Met Office

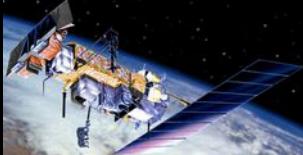
Decision map plots

Decisions Plot (197901)
TEMP Wind





Met Office

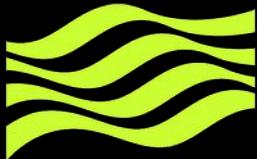


Variational Satellite Bias Correction

- 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



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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



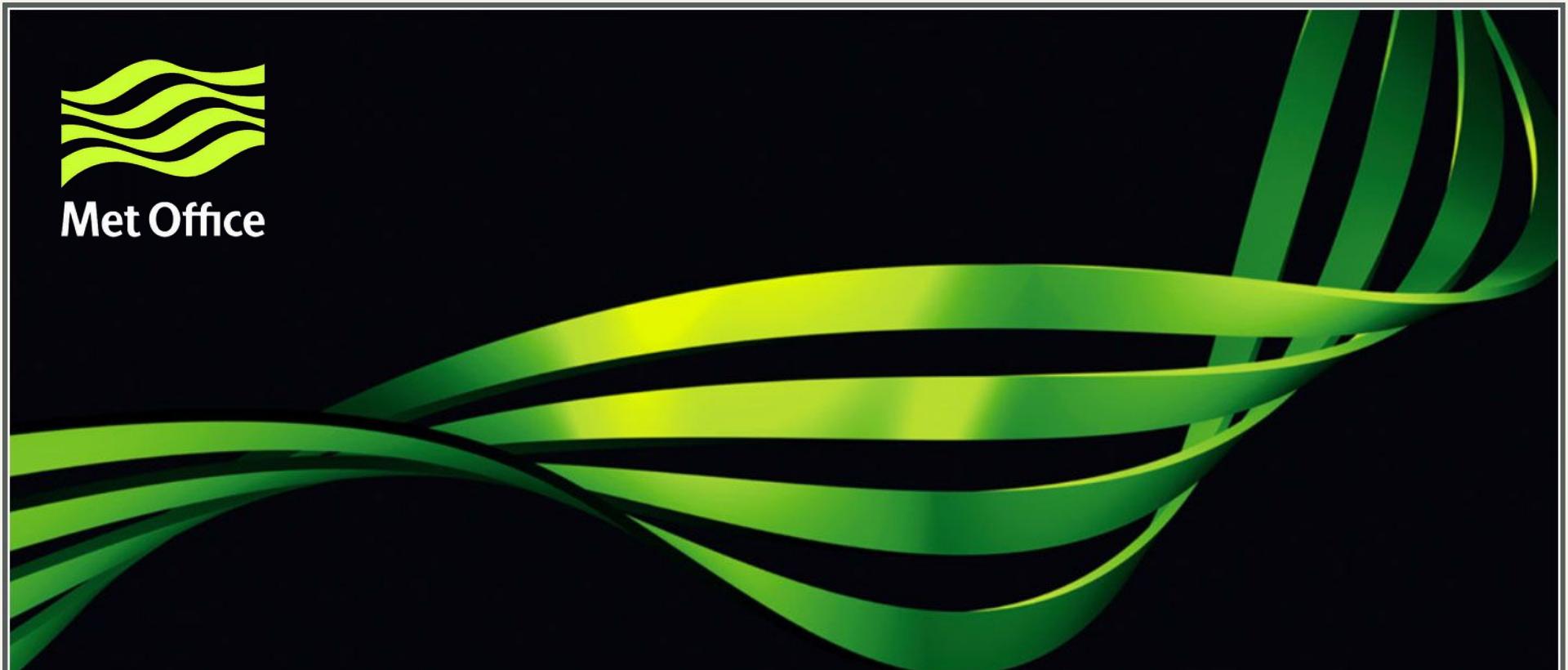
Met Office

Other related future work

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



Met Office



An abstract graphic element consisting of several thick, curved bands in shades of green and yellow, resembling a stylized ribbon or wave pattern, positioned in the upper right quadrant of the slide.

Any questions?