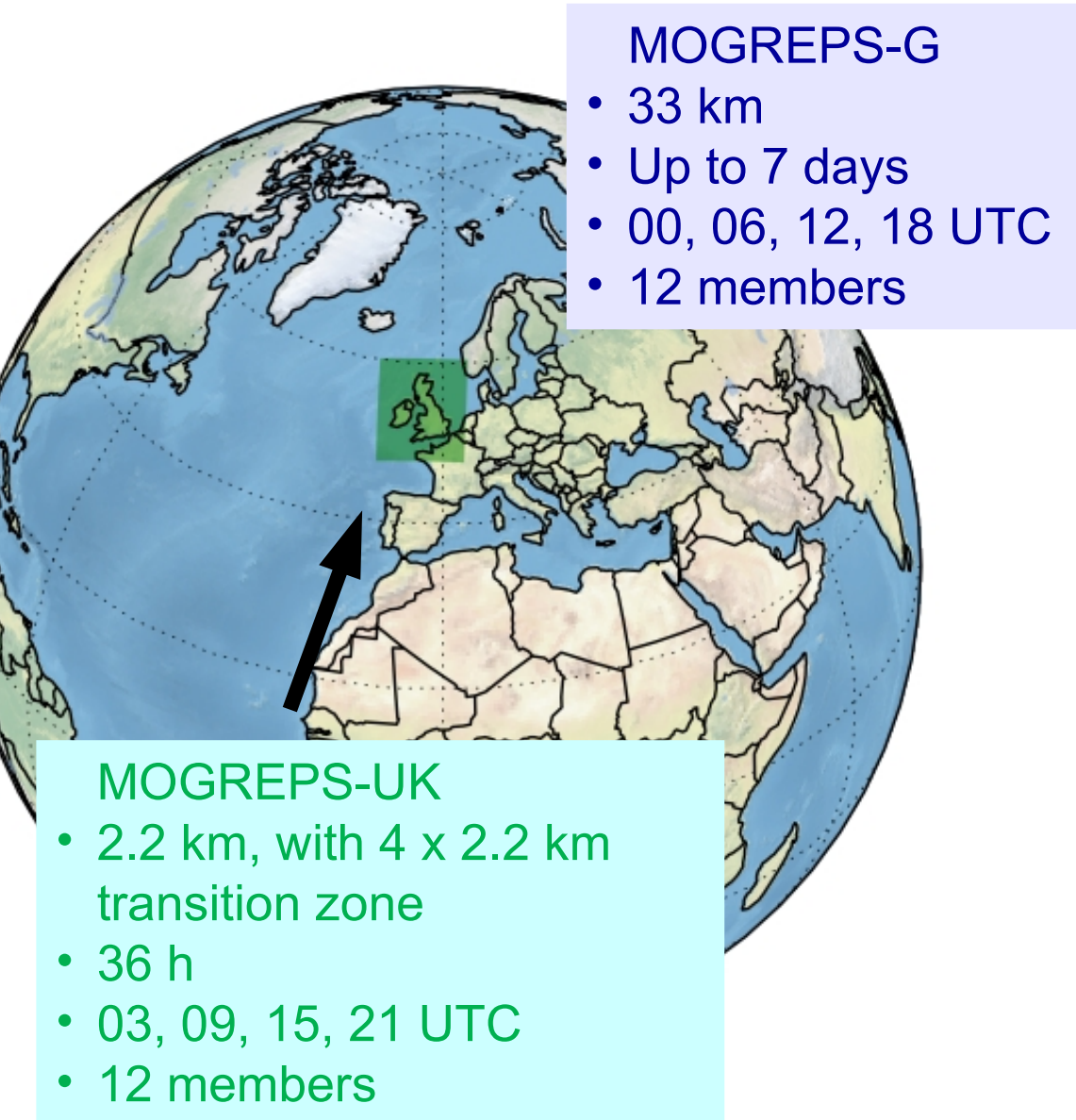# MOGREPS-UK
new developments and future plans

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EWGLAM/SRNWP – Belgrade – 6 Oct 2015

Table of Contents

- Introduction

- Next operational configuration

  - Centring around the UKV

  - Random parameters

- HiRA verification

- Future configurations

  - Higher resolution

- Summary and conclusions

MOGREPS – an overview

MOGREPS-G
- 33 km
- Up to 7 days
- 00, 06, 12, 18 UTC
- 12 members

MOGREPS-UK
- 2.2 km, with 4 x 2.2 km transition zone
- 36 h
- 03, 09, 15, 21 UTC
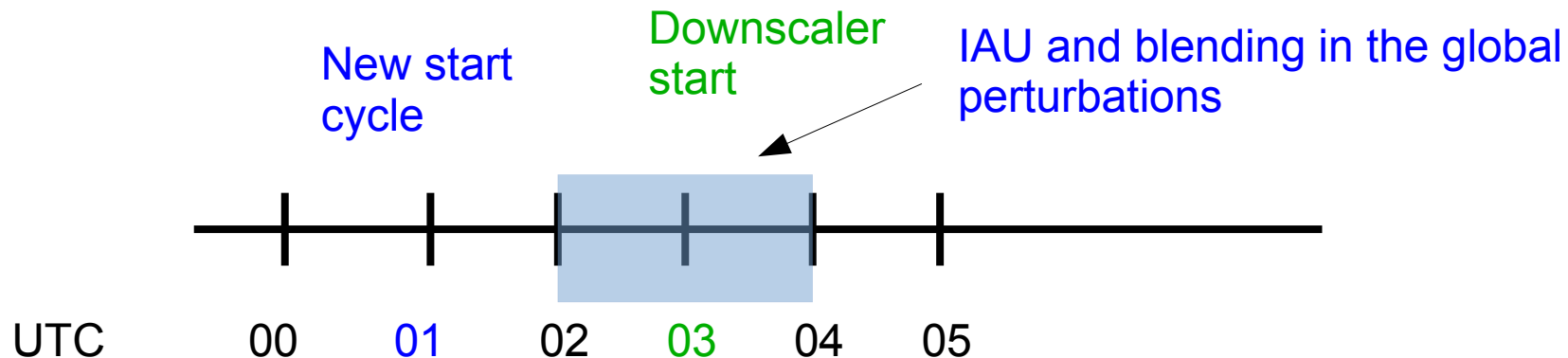- 12 members

- Uncertainties in the forecast are represented using:
  - ETKF for (global) initial conditions perturbations
  - Stochastic physics (global)

MOGREPS-UK

- Run as a direct downscaler using initial conditions and LBCs from the global ensemble
- Same model physics as the 1.5 km deterministic UK model (UKV)

What's new?

- OS 35, ENDGame upgrade, operational 3 Feb 2015

- OS 36, move to new supercomputer, operational 25 Aug 2015

- PS 37 planned to become operational in early spring 2016

    - Two major upgrades to MOGREPS-UK

        - Random parameter scheme
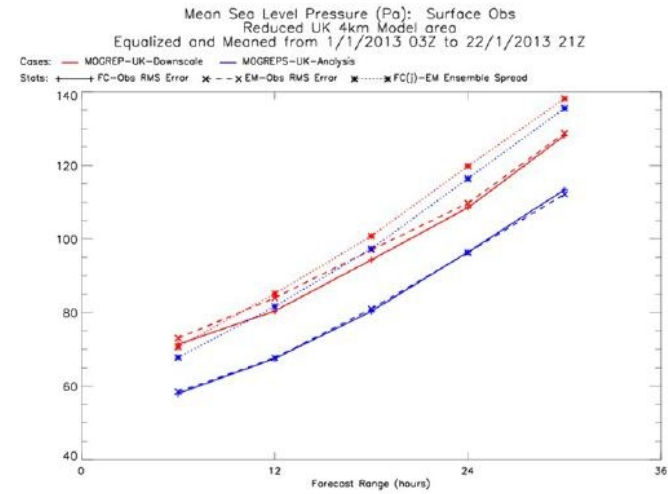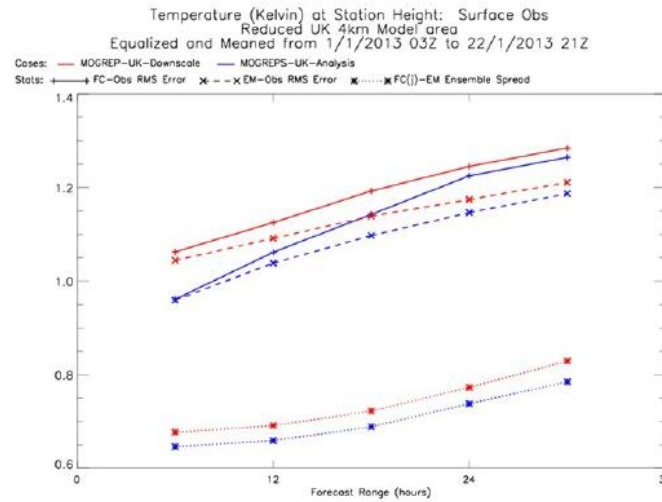   - Centring around the UKV analysis

New start cycle

Downscaler start

IAU and blending in the global perturbations

UTC   00   01   02   03   04   05

Centring around the UKV
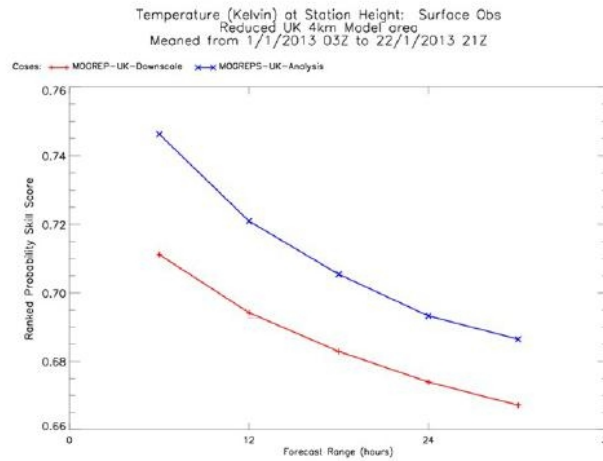## - results from previous trials using ND

Temperature

Mean sea level pressure

Control member RMSE
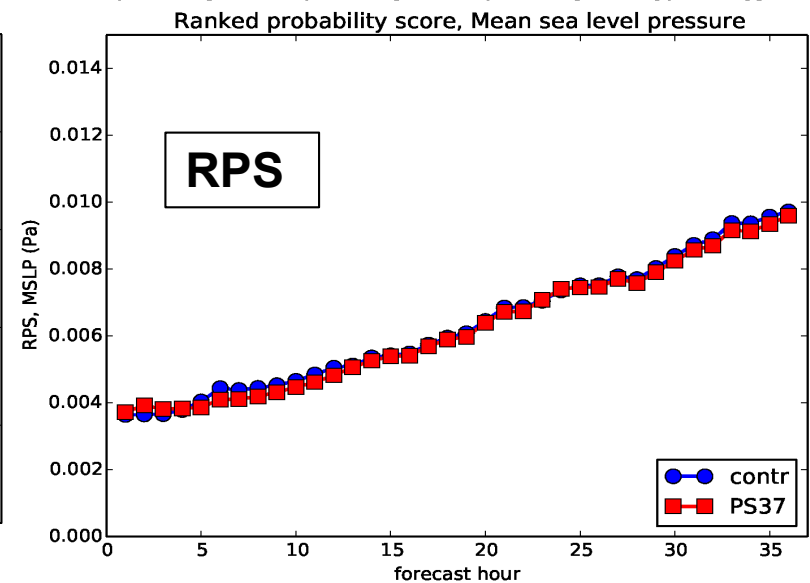
Ensemble mean RMSE

Ens. spread
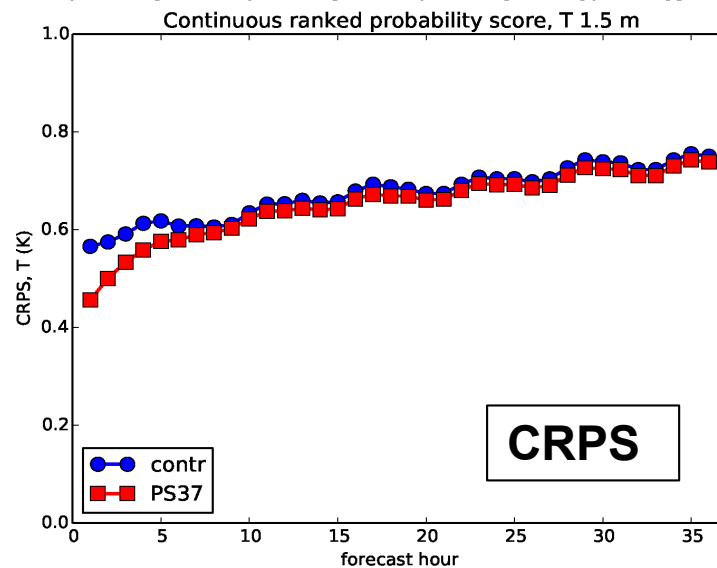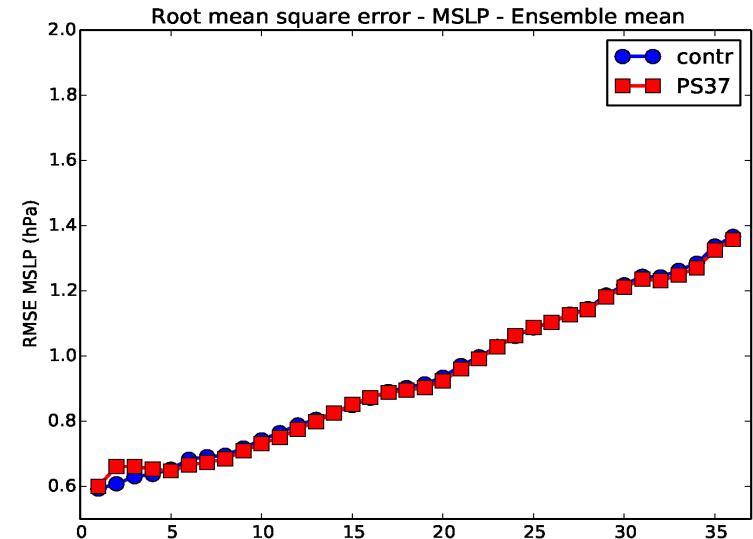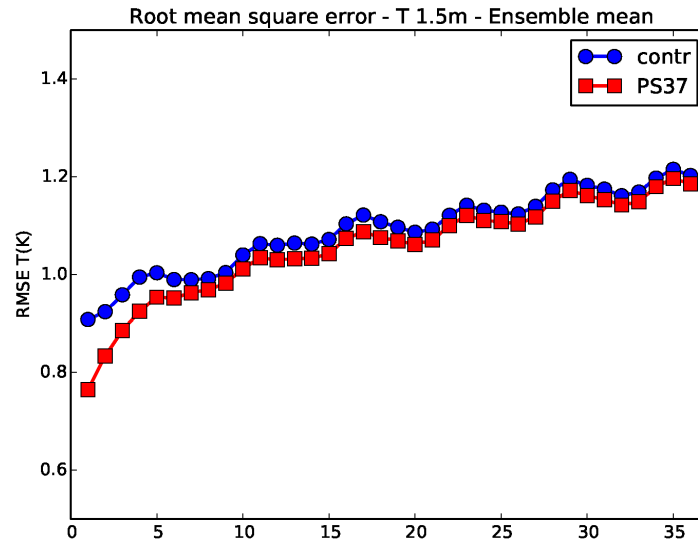
Downscaler
Centring around UKV
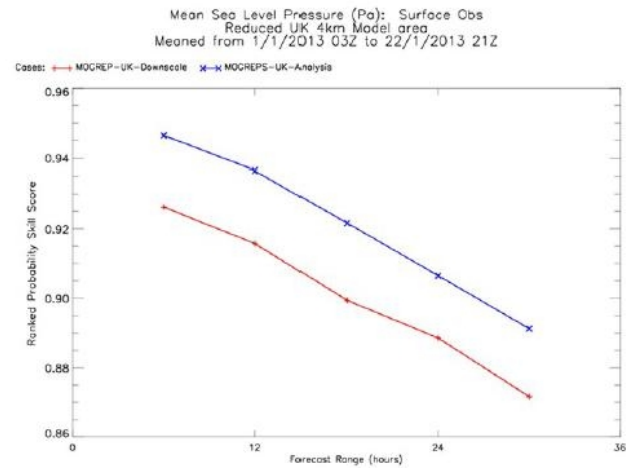
Ranked prob. skill score

1-22 Jan 2013

Almost the same score in pre-PS37
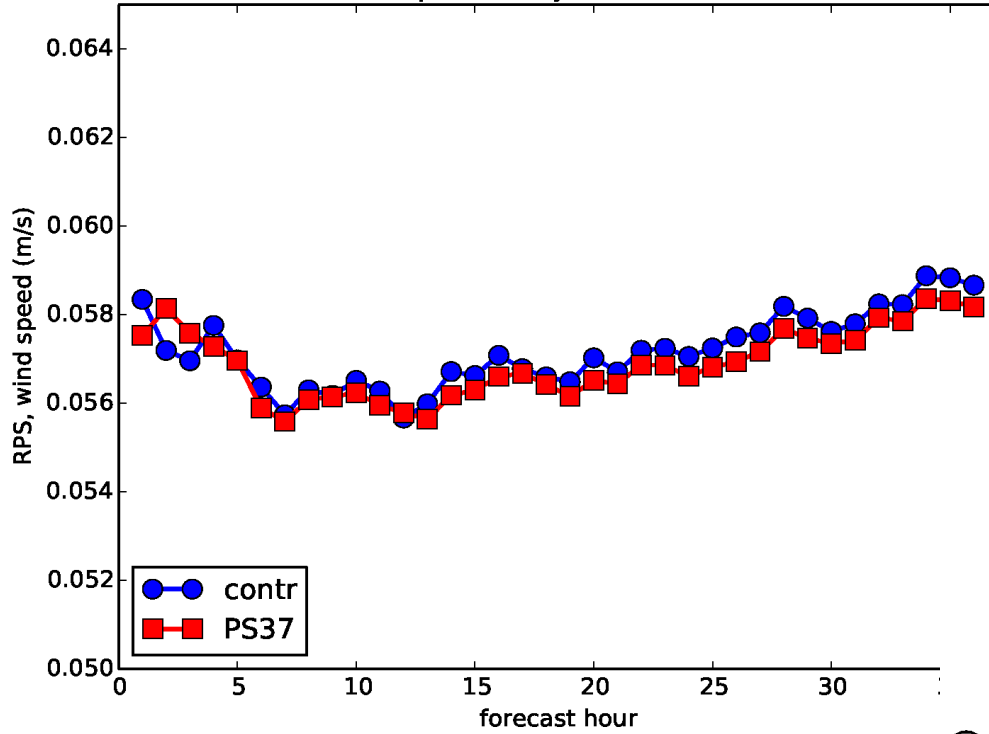4 Feb – 4 March 2015
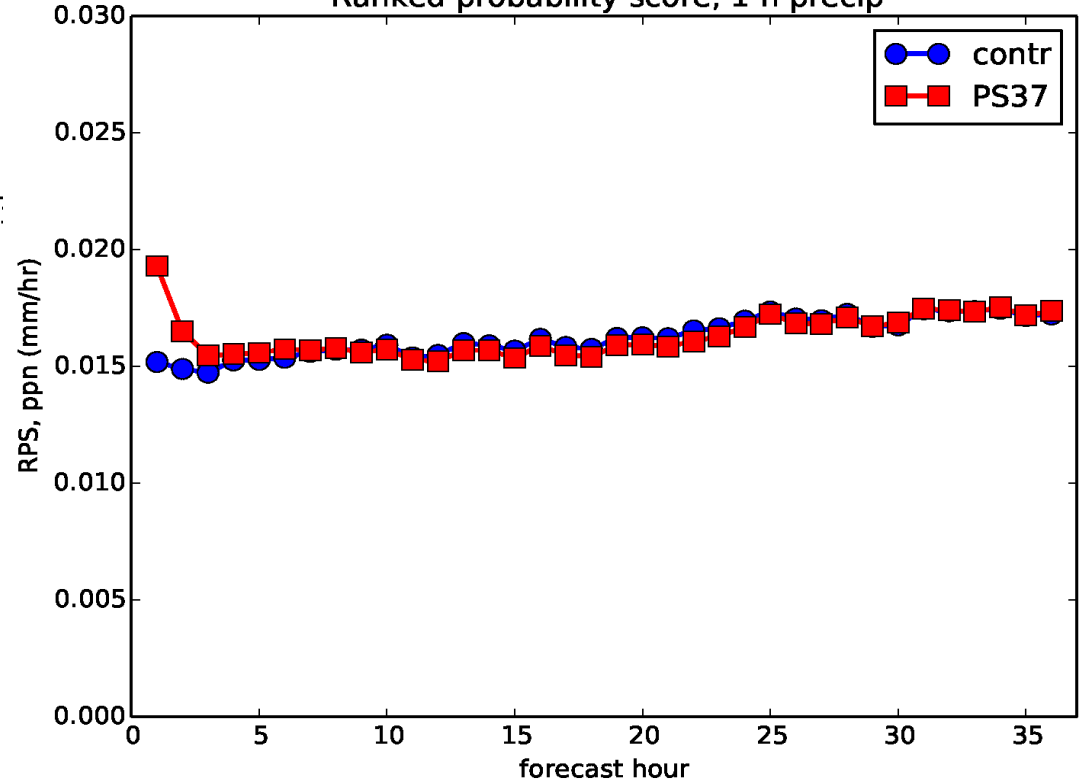
RMSE

Centring around
the UKV
Downscaler

RPS for wind speed and hourly precipitation
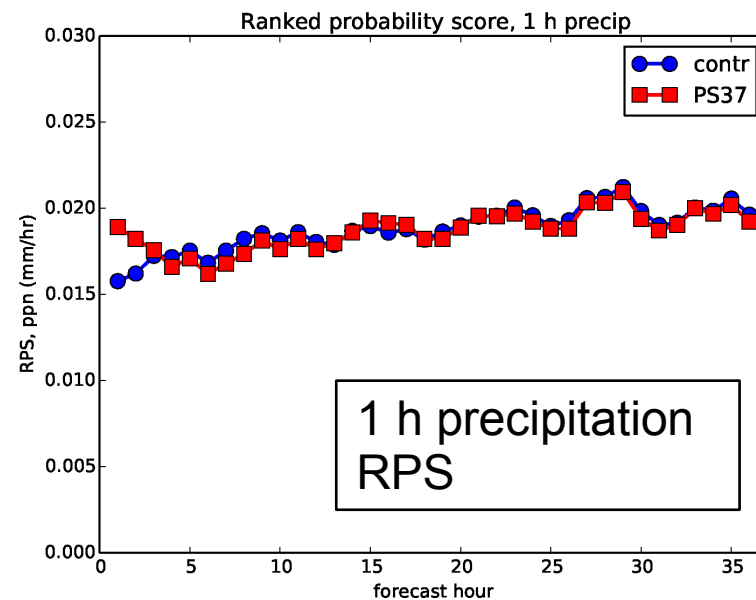
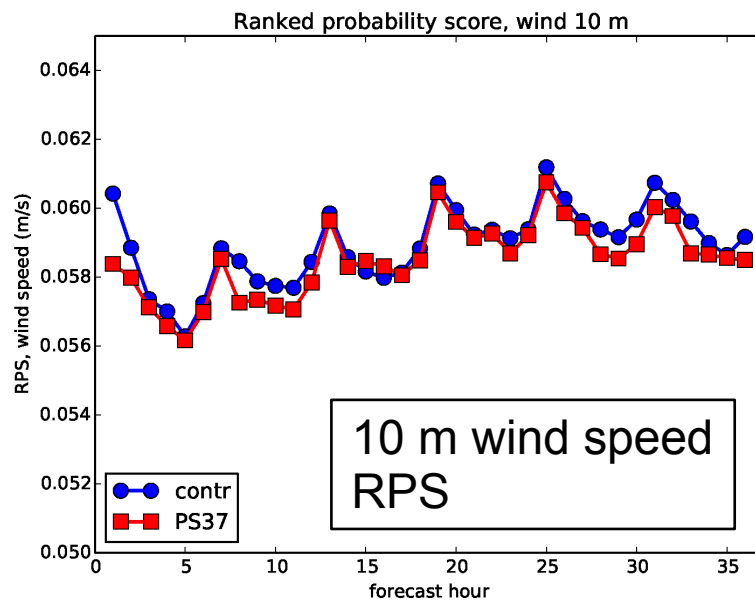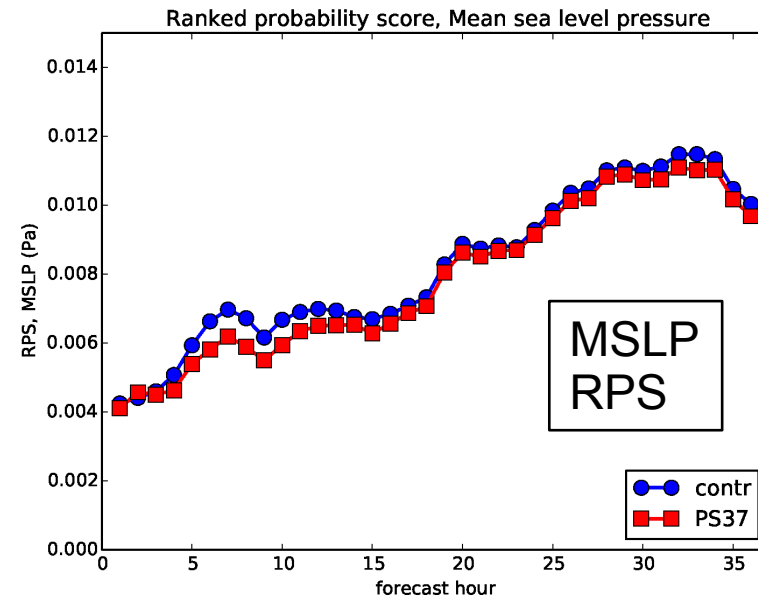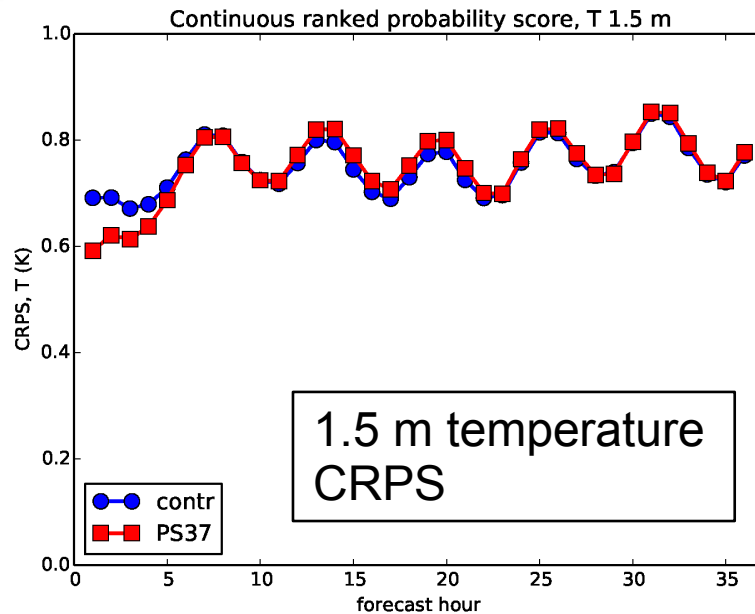Ranked probability score, wind 10 m

Ranked probability score, 1 h precip

4 Feb – 4 March 2015

Shorter summer trial results
1-14 July 2015

Visibility < 1 km
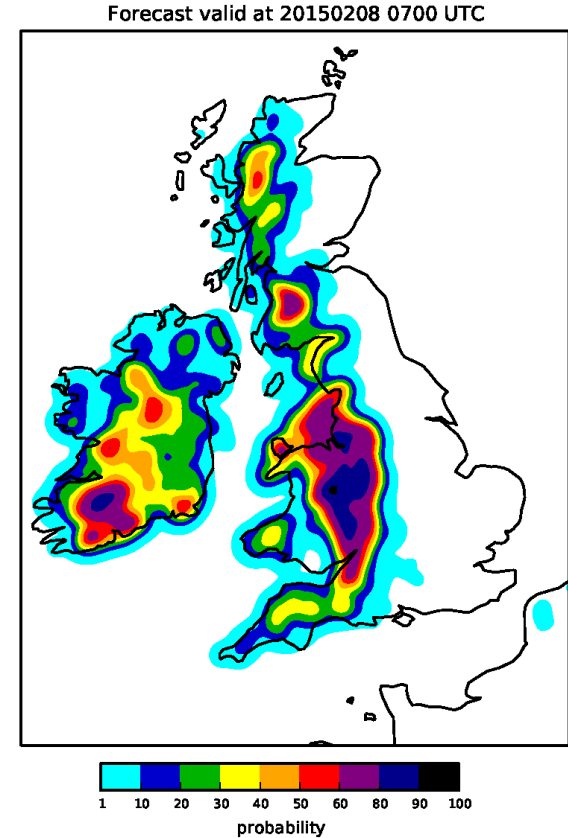## impact of the random parameter scheme
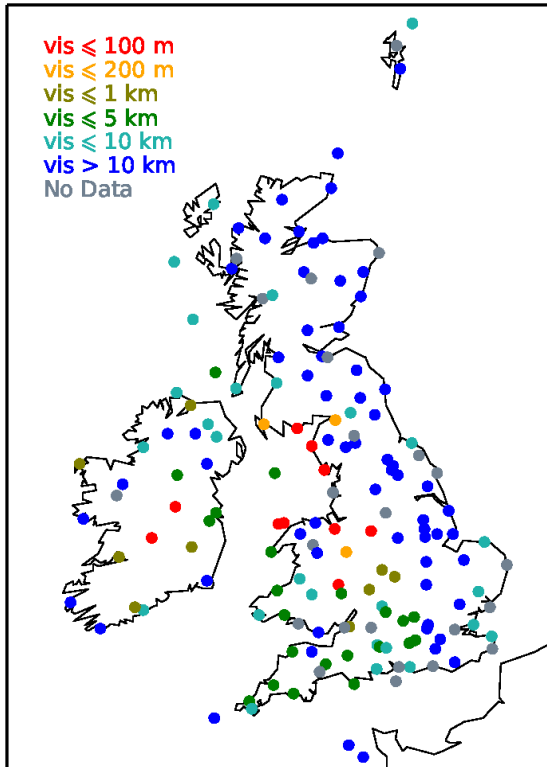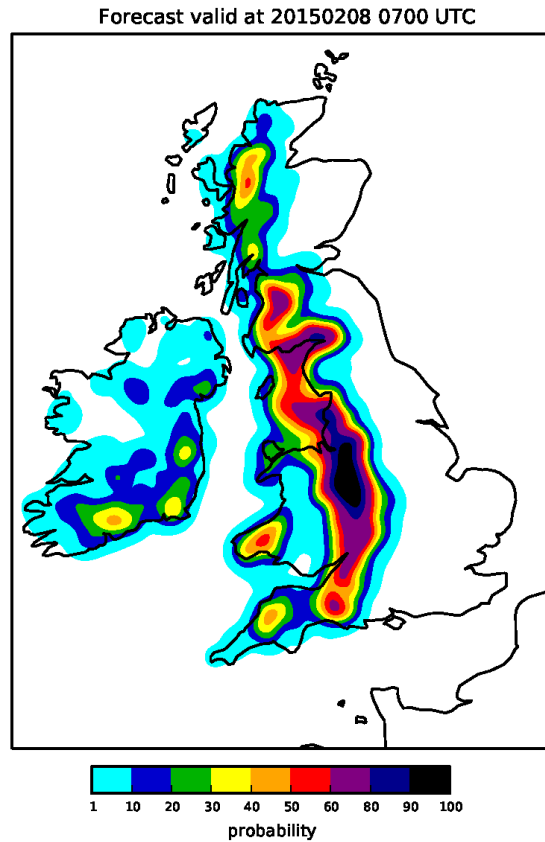
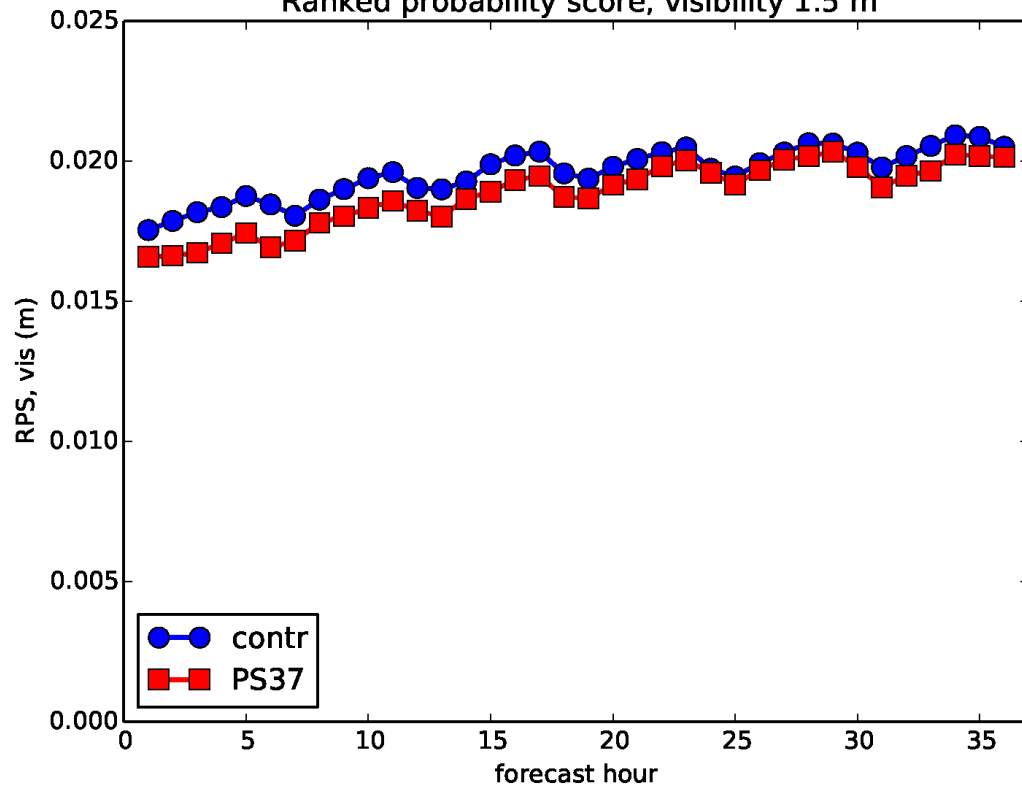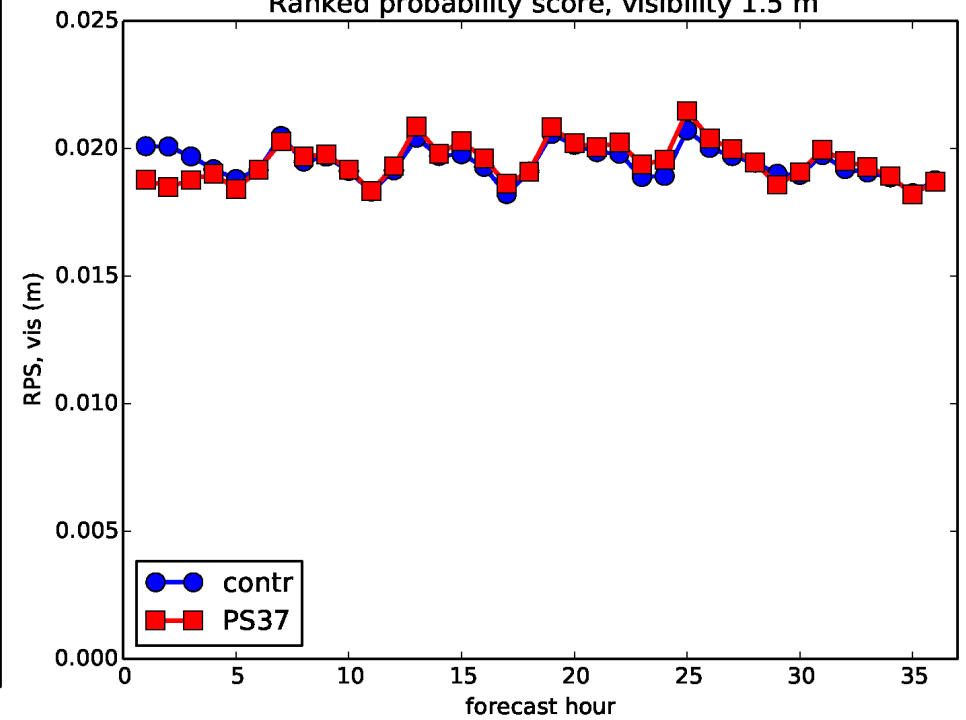# RPS 1.5 m visibility

Winter trial — Ranked probability score, visibility 1.5 m

Summer trial — Ranked probability score, visibility 1.5 m

Neighbourhood verification

- HiRA (High Resolution Assessment) under development by the verification team

- Better comparison of ensemble vs deterministic forecasts and between different resolutions

- Still under development (currently in code review phase)

HiRA verification

1hr Precipitation Accumulation (mm)
Meaned between 20150901 03:00 and 20150929 21:00


Joohyung Son
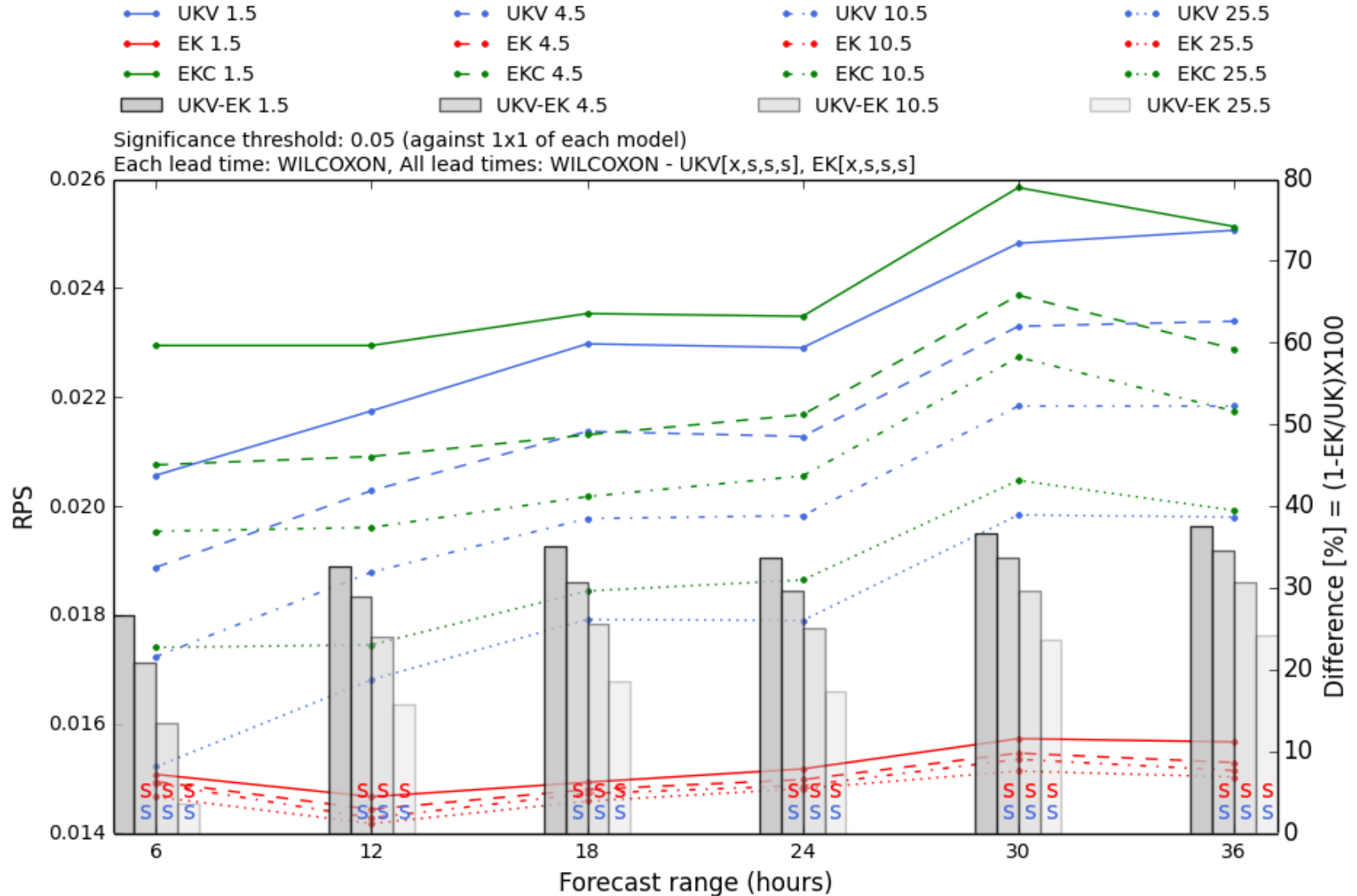
Future configurations

- Extended domain (i.e. extended transition zone)

- Increased run length (T+54h)

- Soil moisture perturbations

- Hourly cycling with smaller ensemble (when UKV 4DVar becomes available)

- Convective scale ensemble data assimilation

- Higher resolution

Higher resolution
from 2.2 km to 1.5 km

- Higher resolution – easiest test is to run at the same resolution as the UKV, 1.5 km

- Test is run using the centring around the UKV configuration

- So far tested for the first week in April 2015

  - Full four cycles per day

  - Verified against 2.2 km centring around the UKV MOGREPS-UK configuration

Higher resolution – prelim. results
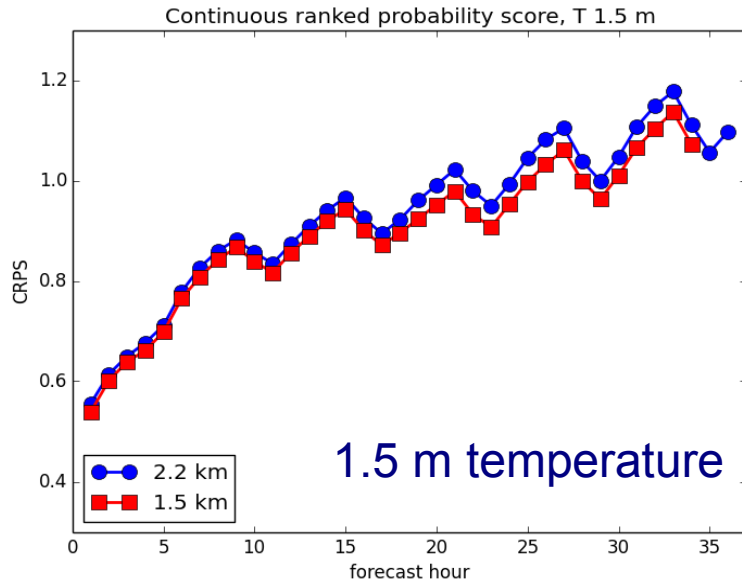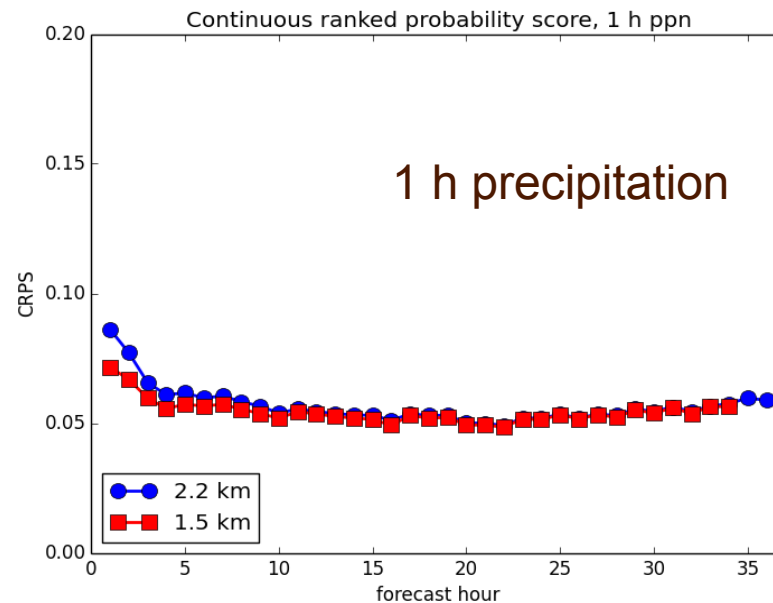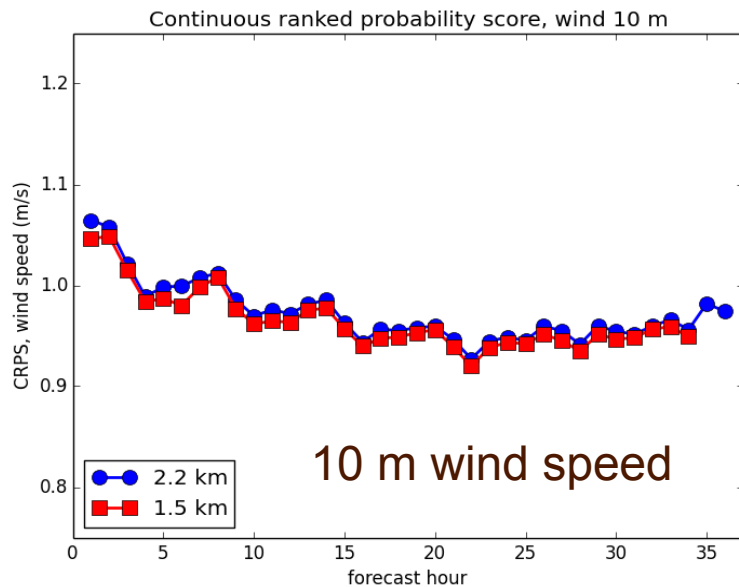

CRPS consistently lower for the 1.5 km resolution

<u>To-do list</u>
Longer trial
Neighbourhood verification

Summary and conclusions

- PS37 represents a small improvement overall in the forecast scores

- The RP scheme in particular improves the visibility forecast

- Neighbourhood verification to be implemented for routine verification

- Higher resolution improves forecast, but is it worth the extra computer cost?

Thank you for your attention.