

# **gSREPS: Mesoscale EPS in AEME.Status.**

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**Spanish Met Service - AEMET  
HIRLAM-ALADIN All Staff Meeting  
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# g-SREPS

- Multimodel:
  - Harmonie (AROME and ALARO)
  - WRF (ARW and NMM, then NMMB)
- Multiboundaries (Global models):
  - ECMWF
  - GSM from JMA (Japan Meteorological Agency)
  - GFS from NCEP
  - CMC from SMC (Canadian Weather Service)
  - Arpege from MeteoFrance
- 36 hours forecast four times a day (00, 06, 12 & 18 UTC)

# g-SREPS

- Characteristics:
  - 4 models
  - 5 boundary conditions
  - [+2 latest ensembles (HH & HH-06)]
  - 20 members ensemble every 6 hours
  - Time-lagged Super-Ensemble of 40 members every 6 hours.
  - 2.5 km horizontal resolution
- LETKF for ICs perturbations
- SPPT for additional model perturbations
- Calibration – Extended Logistic Regression (BMA or ELR)
- Focused on surface parameters (Precip, 2mT, 10mwind, radar reflectivity, surface radiation fluxes)

- Domain IBERIA\_2.5 - Physics AROME – 5 members (no control)
- Pure downscaling: No Upper Air Data Assimilation.
- EPS5 members:
  - 0 → **ECMWF** –ECMWF Global Det. Model.
  - 1 → **GFS** – NCEP (USA) Global Det. Model.
  - 2 → **CMC** – CMC (Canadian Met. Service) Global Det. Model.
  - 3 → **ARPEGE** – MeteoFrance Global Det. Model.
  - 4 → **JMA** – JMA (Japan Met. Agency) Global Det. Model.

# Global Models

Member	Model	How they are			What we get (Every 3 hours – 00 and 12 UTC)		
		Hor Res (km)	Vert Levels #	Type of levels	Hor Res (Km)	Vert Levels	Type of levels
0	ECMWF	16	137	Hybrid	16 (0.16 deg)	137	Hybrid
1	GFS	13	64	Sigma	26 (0.25 deg)	26	Pressure
2	CMC	25	80	Hybrid	25 (0.24 deg)	28	Pressure
3	Arpege	7	105	Hybrid	11 (0.10 deg)	<b>28</b>	Pressure
4	JMA	20	100	Hybrid	<b>55 / 25 (0.5 / 0.25 deg)</b>	86	Hybrid

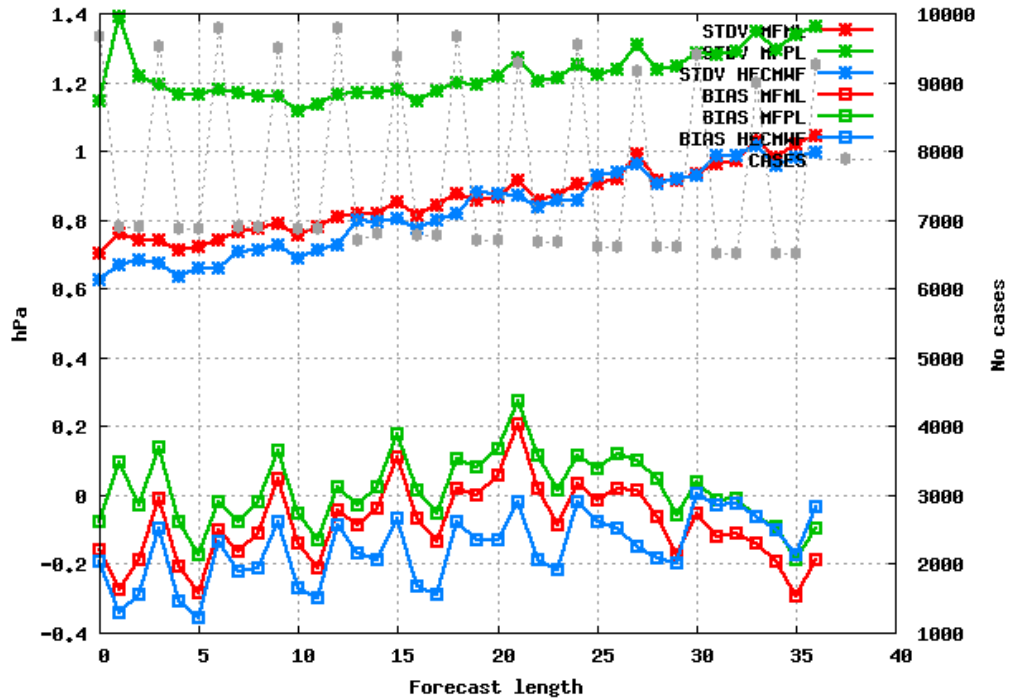
# Experiments – MFML MFPL

- Harmonie
- Domain IBERIA\_2.5 - Physics AROME
- Pure downscaling: ANAATMO=blending - ANASURF=CANARI\_OI\_MAIN to adjust soil parameters needed by the Harmonie model.
- Experiments:
  - MFML – BCs from Arpege model levels (Thanks to Claude Fischer)
  - MFPL – BCs from Arpege pressure levels
  - HECMWF – Bcs from ECMWF
- Period: 2016011512 - 2016020300

# Global Models - ARPEGE

Model	How they are			What we get (Every 3 hours – 00 and 12 UTC)		
	Hor Res (km)	Vert Levels #	Type of levels	Hor Res (Km)	Vert Levels	Type of levels
ECMWF	16	137	Hybrid	16 (0.16 deg)	137	Hybrid
Arpege MFPL	7	105	Hybrid	11 (0.10 deg)	<b>28</b>	Pressure
Arpege MFML	7	105	Hybrid	10	<b>60</b>	Hybrid

Selection: ALL using 140 stations  
 Mslp Period: 20160115-20160203  
 Hours: {00,06,12,18}



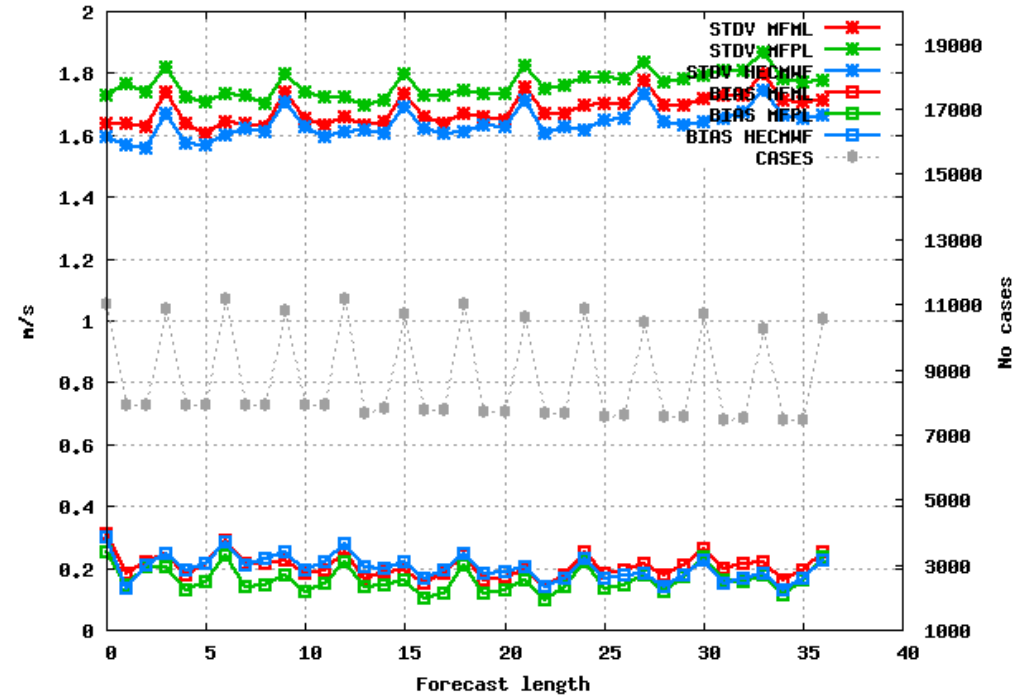
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# MSLP



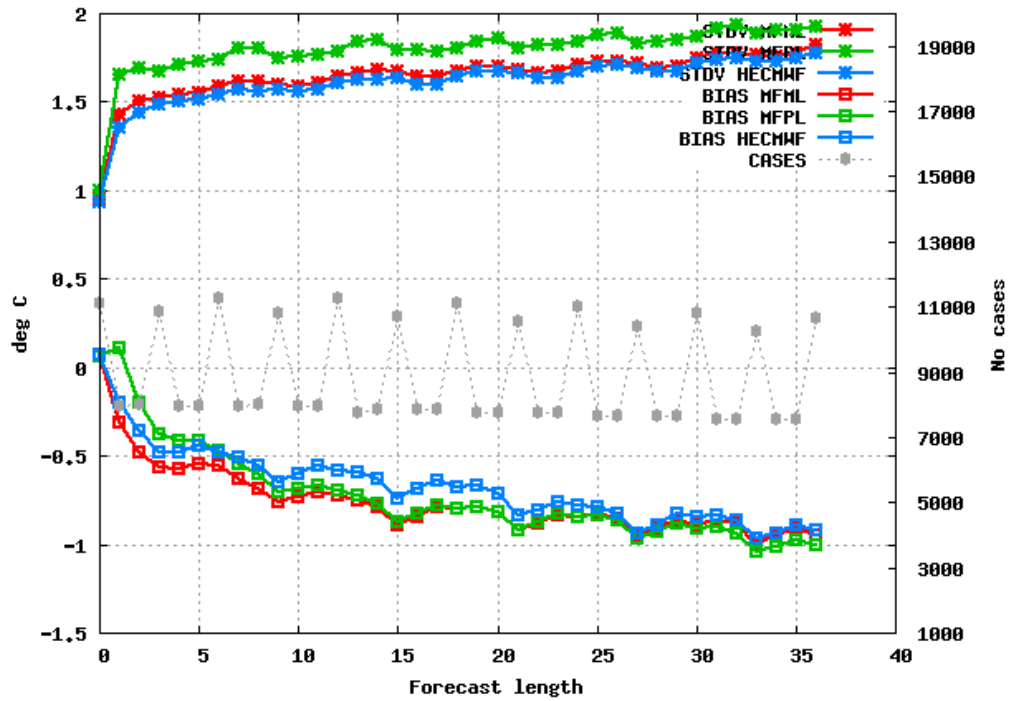
HECMWF - blue  
 MFPL - green  
 MFML - red  
 U10m

Selection: ALL using 161 stations  
 U10m Period: 20160115-20160203  
 Hours: {00,06,12,18}





Selection: ALL using 162 stations  
 T2m Period: 20160115-20160203  
 Hours: {00,06,12,18}



T2m

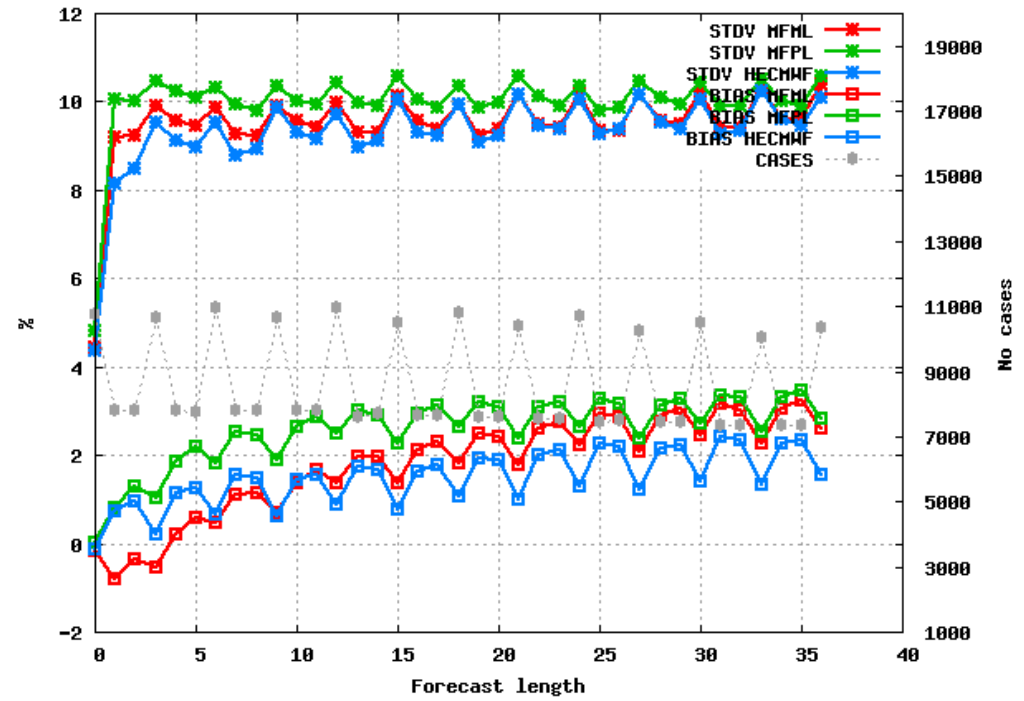
HECMWF - blue

MFPL - green

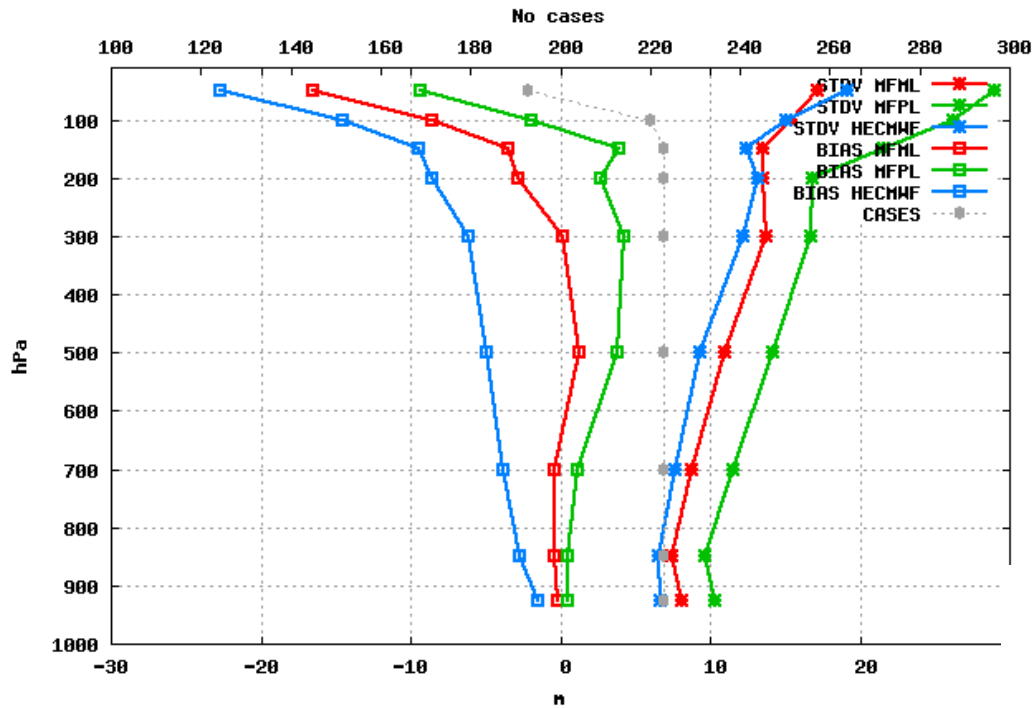
MFML - red

RH2m

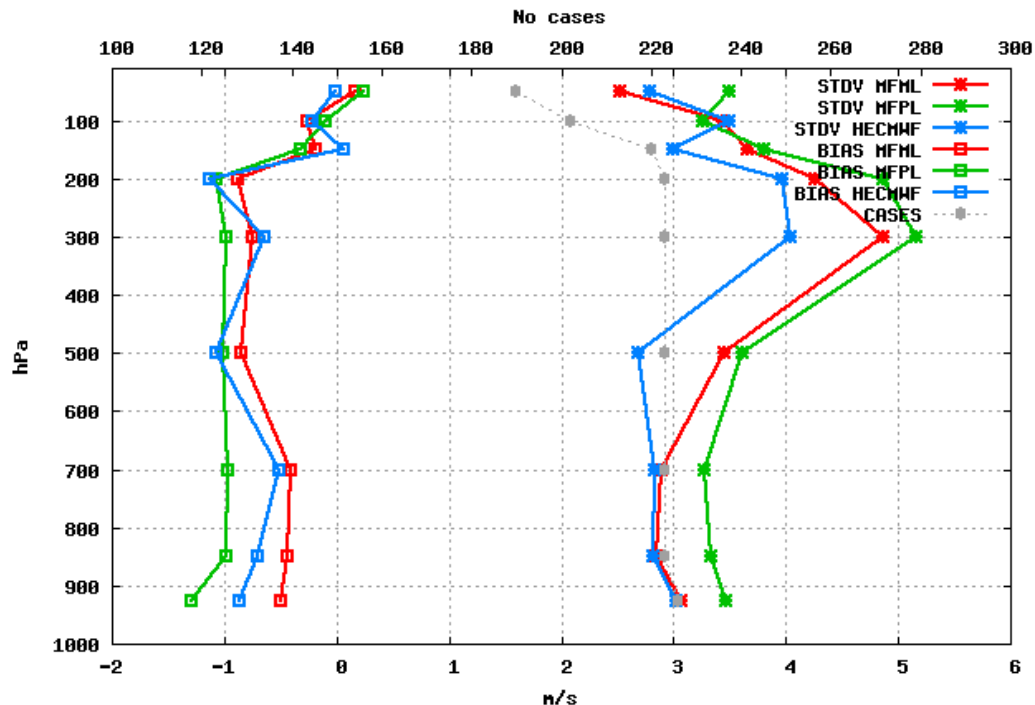
Selection: ALL using 160 stations  
 Rh2m Period: 20160115-20160203  
 Hours: {00,06,12,18}



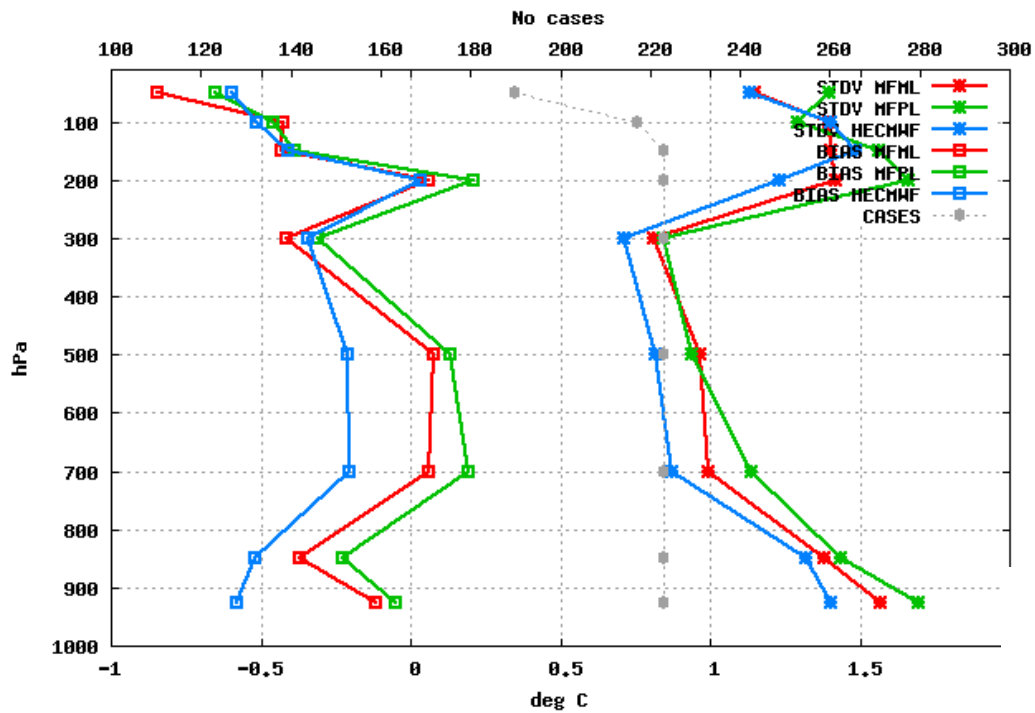
5 stations Selection: ALL  
 Height Period: 20160115-20160203  
 Statistics at 00 UTC Used {00,12} + 12 24 36



**HECMWF - blue**  
**MFPL - green**  
**MFML - red**  
**Wind Speed**

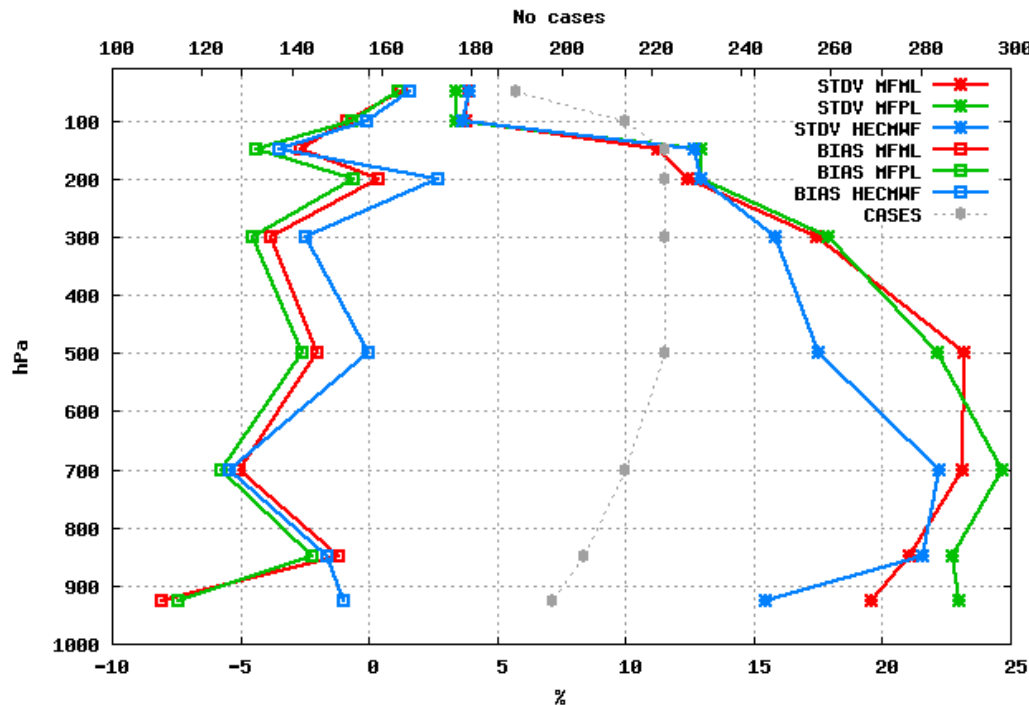


5 stations Selection: ALL  
 Temperature Period: 20160115-20160203  
 Statistics at 00 UTC Used {00,12} + 12 24 36

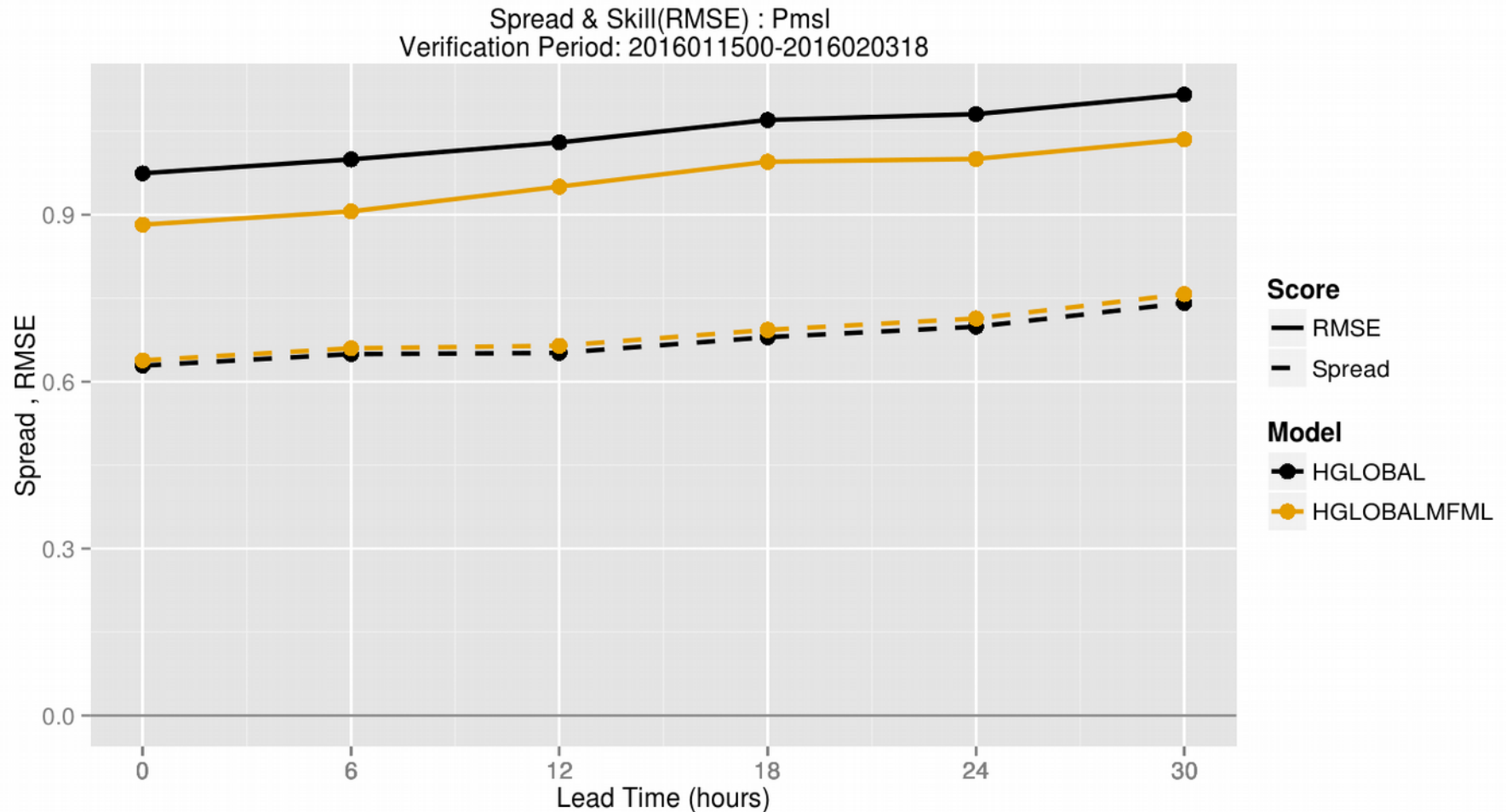


HECMWF - blue  
 MFPL - green  
 MFML - red  
 RH

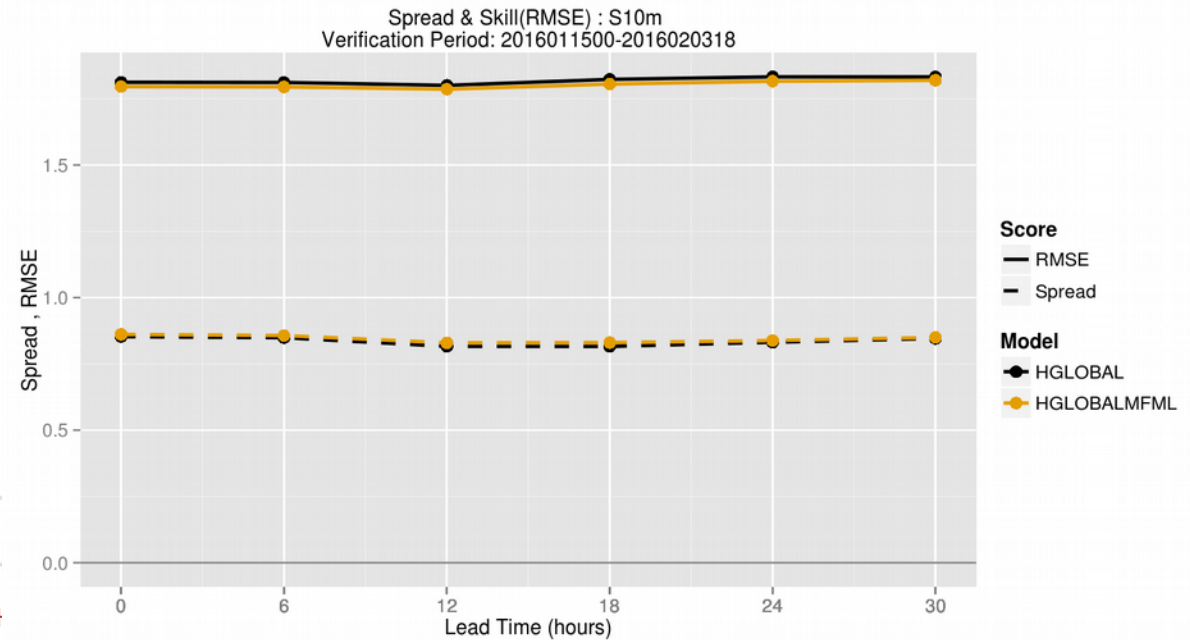
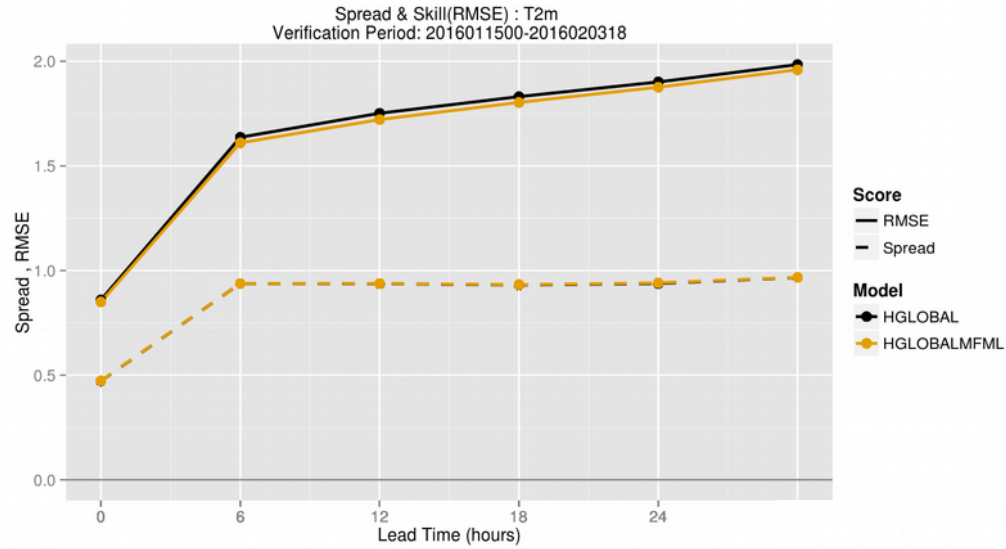
5 stations Selection: ALL  
 Relative Humidity Period: 20160115-20160203  
 Statistics at 00 UTC Used {00,12} + 12 24 36



# Prob. Verification

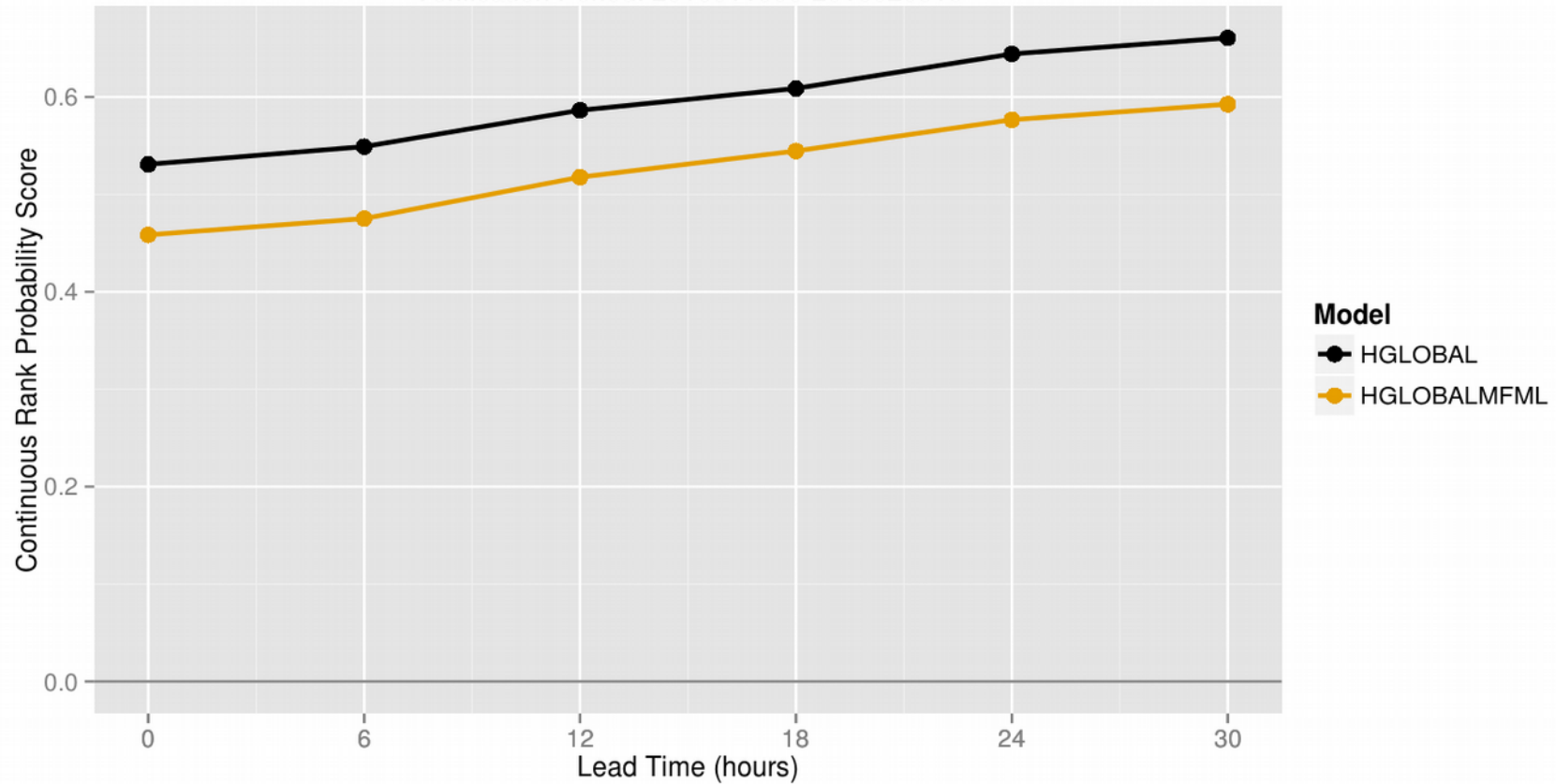


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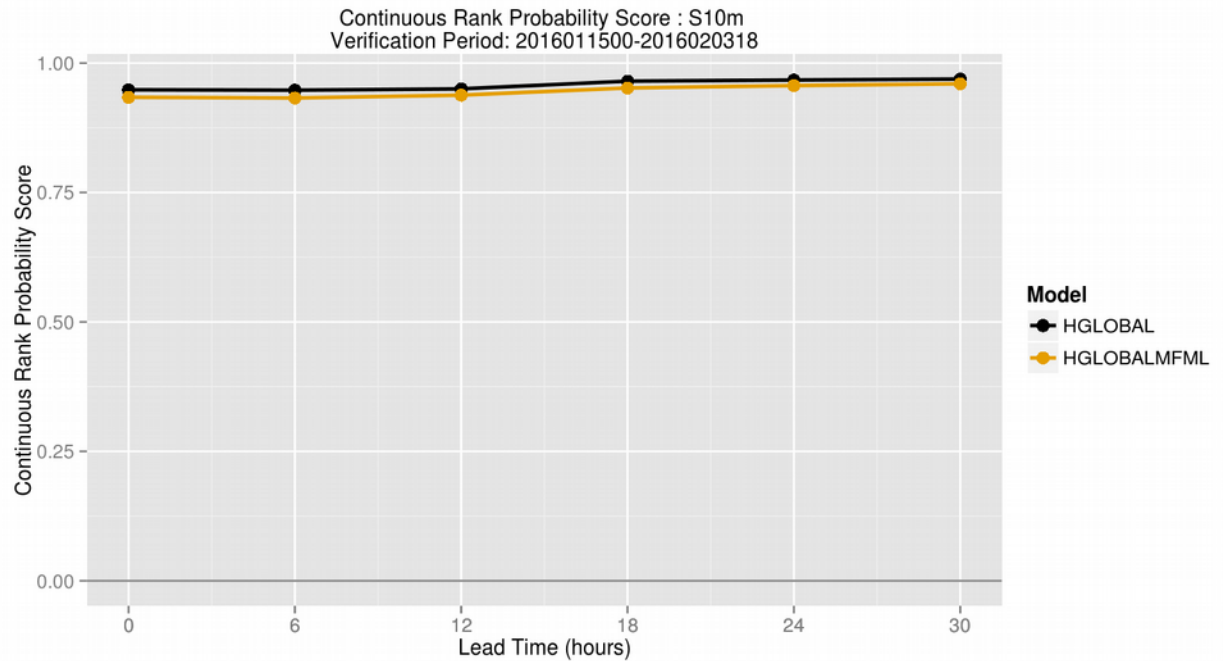
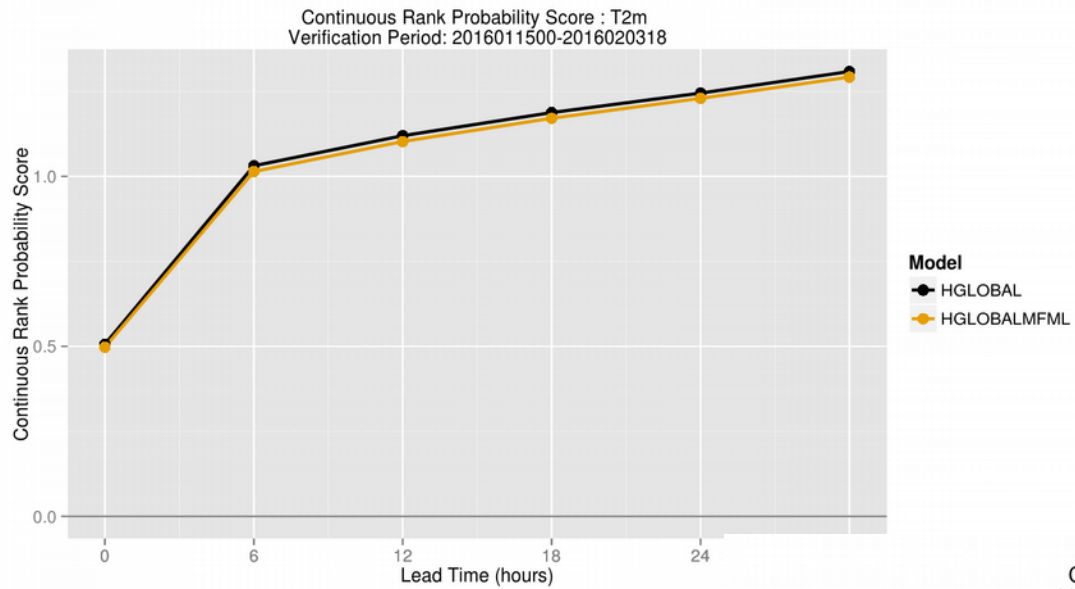


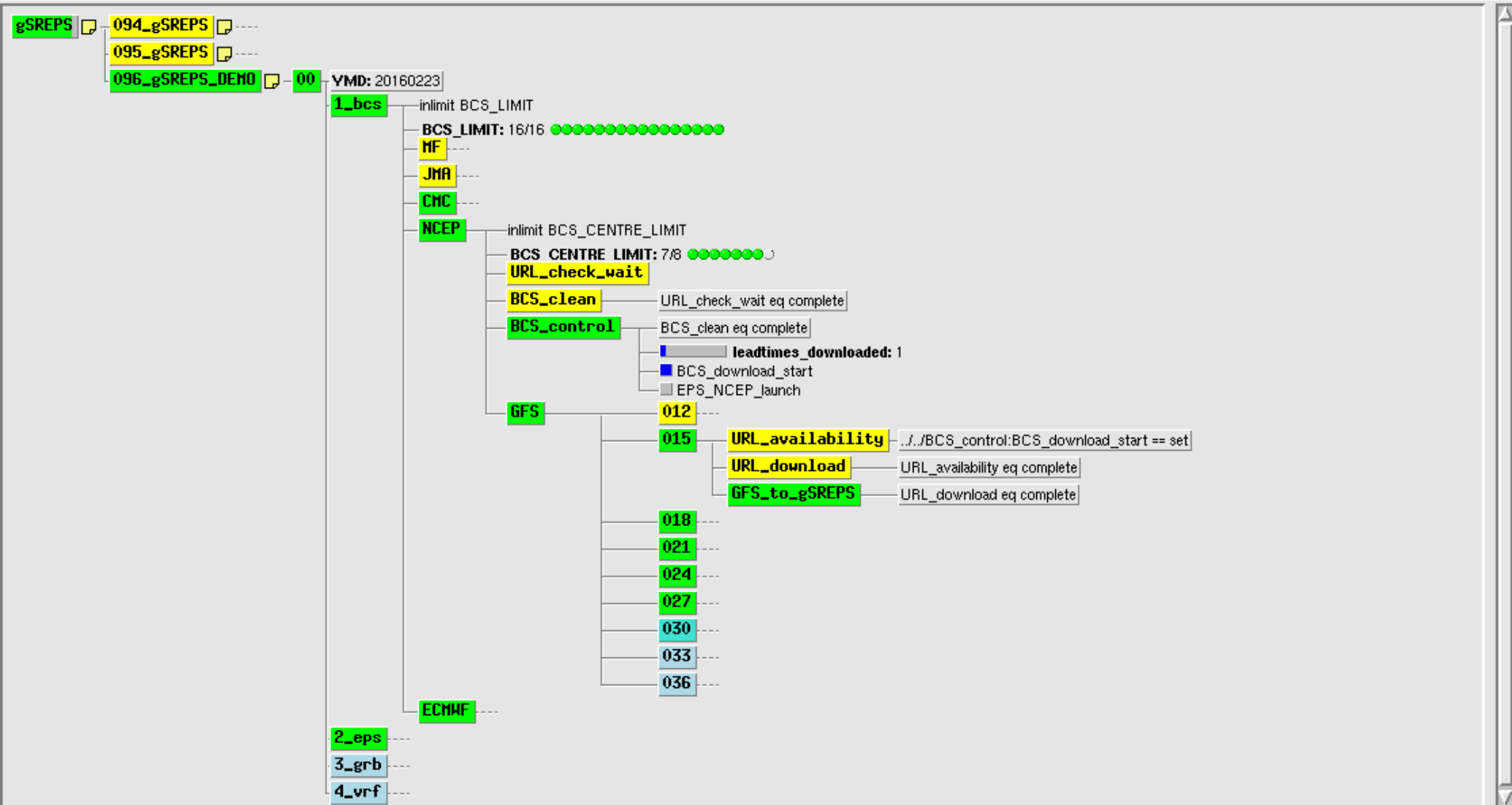
# Prob. Verification

Continuous Rank Probability Score : Pmsl  
Verification Period: 2016011500-2016020318

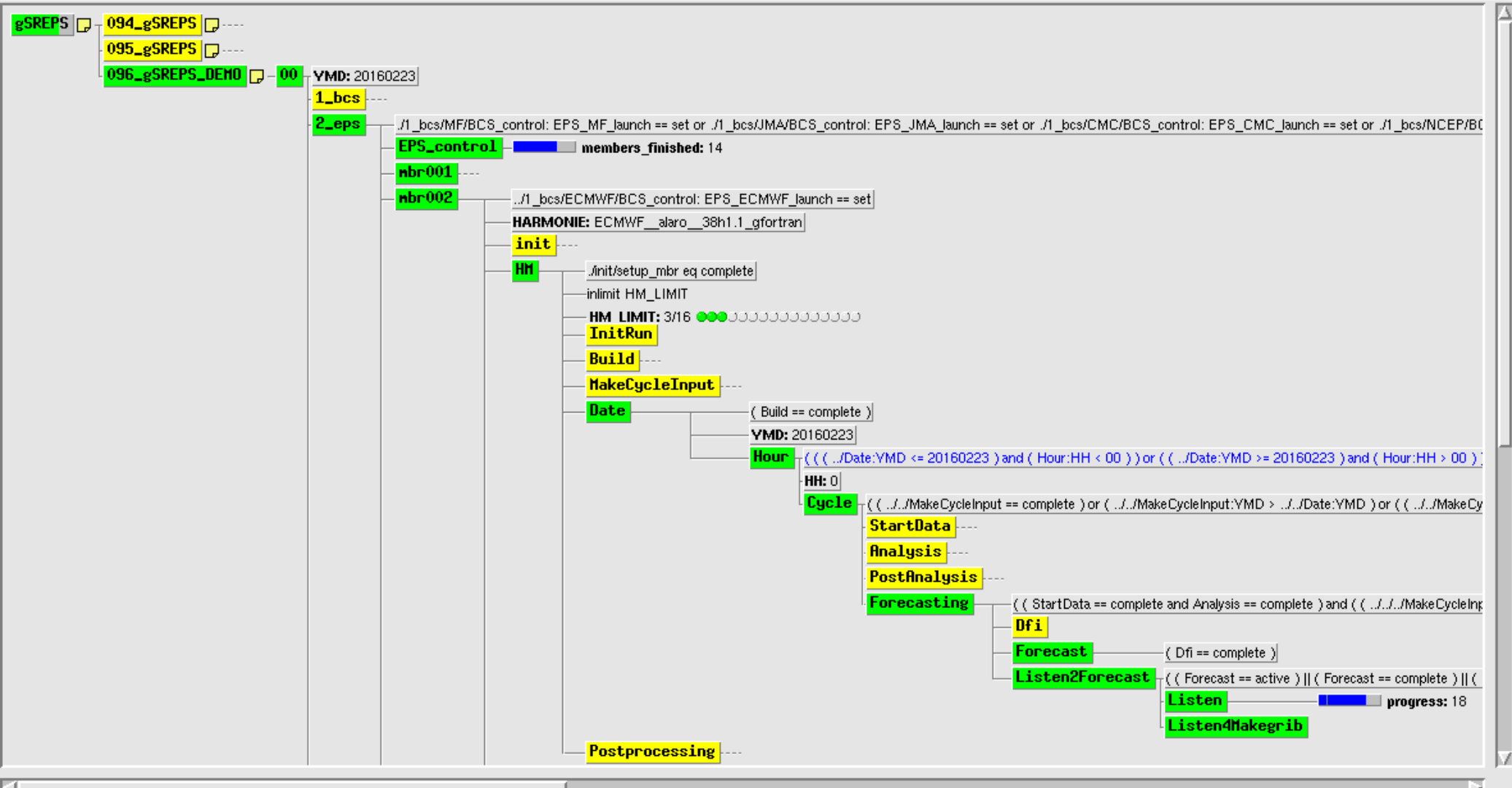


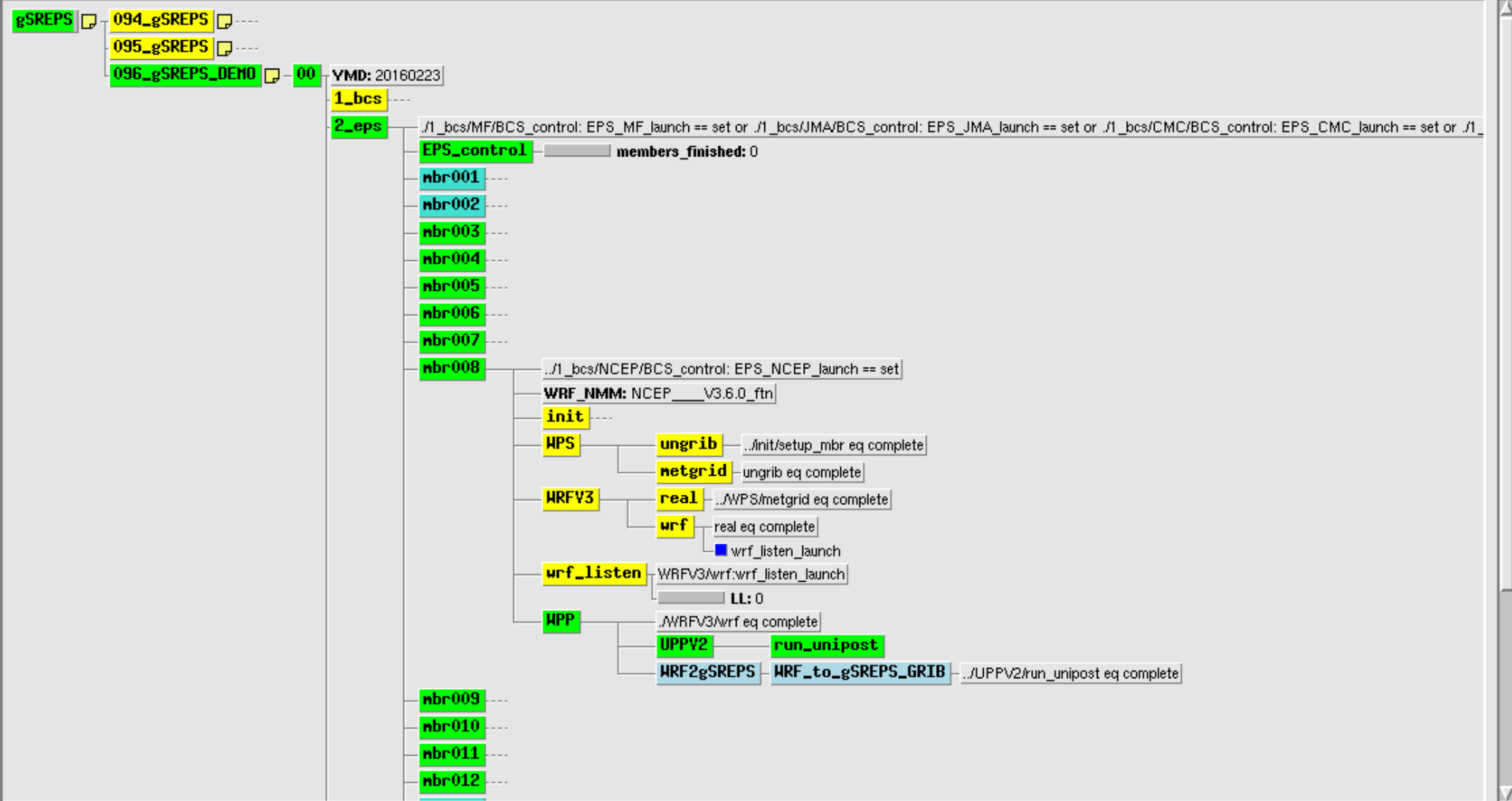
# Prob. Verification











# Future work I

- Pre-operational daily run (00 and 12 UTC) at ECMWF from beginning of May
- Pre-operational daily run (00, 06, 12 18 UTC) at ECMWF from beginning of October
- Operational (00, 06, 12 18 UTC) at AEMET/ECMWF from spring 2017
- Testing the system at AEMET Bull computer
  - Running Harmonie and WRF
  - Using global models as BCs
  - Running the system in pre-operational mode (October 2016)

# Future work

- General developments:
  - Increasing horizontal resolution of GSM from JMA (0.5 deg. to 025 deg.).
  - Increasing soil layers of GSM (JMA) to new 7 layers.
  - Increasing vertical resolution of Arpege data (from 28 to 60 vertical levels in model levels).
  - Increasing horizontal and vertical resolution of GFS (NCEP).
  - Testing SPPT scheme in Harmonie and WRF
  - Testing LETKF in Harmonie
  - Calibration of products
  - New interactive web page for gSREPS devoted to severe weather events (similar to <http://ensemble.ucar.edu/>)

# http://ensemble.ucar.edu



## NCAR Ensemble Forecasts

Initialized: 00 UTC Thu 31 Mar 2016

### Ensemble Summary

Ens Mean 48-hr Precip

Ens Mean 48-hr Snowfall

**Ens Mean 48-hr Freezing Rain**

Ens Mean 48-hr Sleet

Ens Max 48-hr Updraft Helicity

Ens Max 48-hr Updraft Speed

Ens Max 48-hr Surface Wind

### What's New

- **NEW:** [Member Viewer for CREF/UH](#)
- **NEW:** [Ensemble Plumes Page](#)
  
- [New Winter Products Added](#)
- [WAF Article Describing Ensemble System](#)
- [Ensemble soundings](#) now available at every 30th grid point
- [Addition of Frequently Asked Questions](#) webpage

Surface / Precip

Upper-Air

Severe

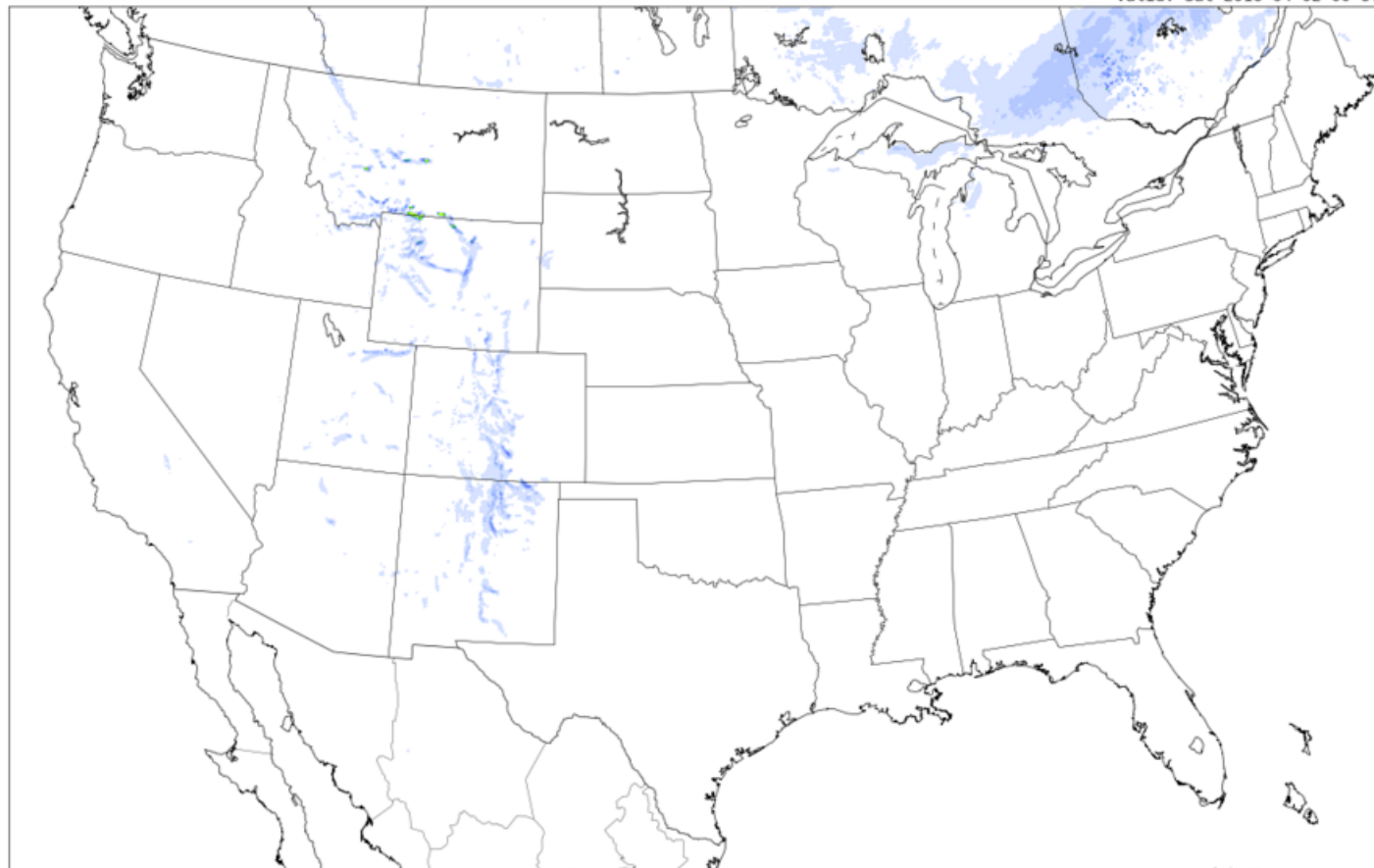
Winter

Hourly-Max

Domains

### Ensemble mean 48-hr accumulated freezing rain (in)

Init: Thu 2016-03-31 00 UTC  
Valid: Sat 2016-04-02 00 UTC



NCAR  
ensemble.ucar.edu

