

NAEFS upgrade

Expect: September 2015

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Environmental Modeling Center

Present for WPC staffs

May 5th 2015

Highlight of upgrade

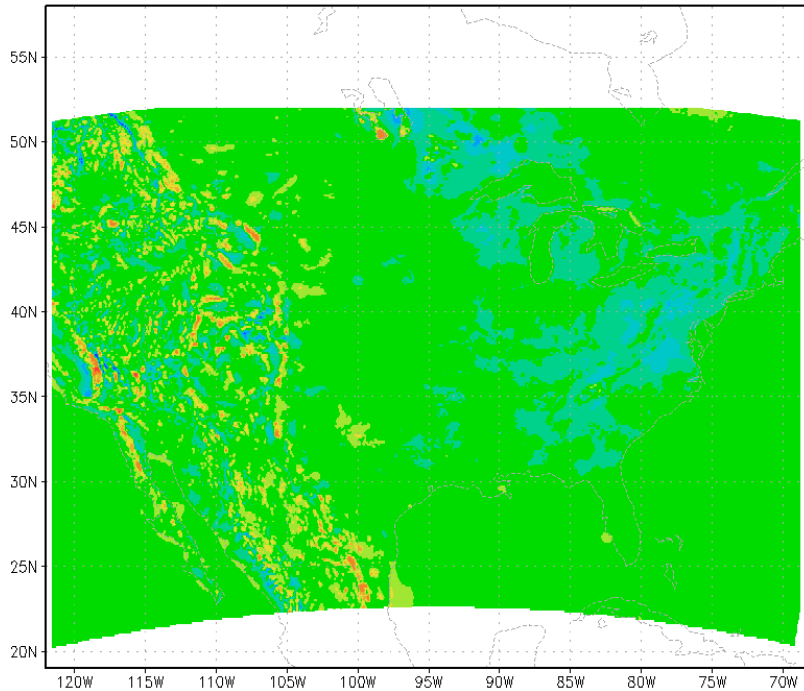
- All GEFS and NAEFS downscaled products will be at finer NDGD resolution
 - 2.5km for CONUS
 - 3km for Alaska
- Add new product – cloud cover
 - Bias corrected at 1*1 degree
 - Downscaled to 2.5km NDGD resolution
- Process ECMWWF global ensembles
 - Internal use only (WPC)
 - Bias correction at 1*1 degree
 - Downscaled to 2.5km for CONUS (?)
- Additional products (?)
 - Anomaly forecast – based on new GEFS (already in)
 - EFI – based one 18-year reforecast climatology

Downscaling Vector Sample Comparison

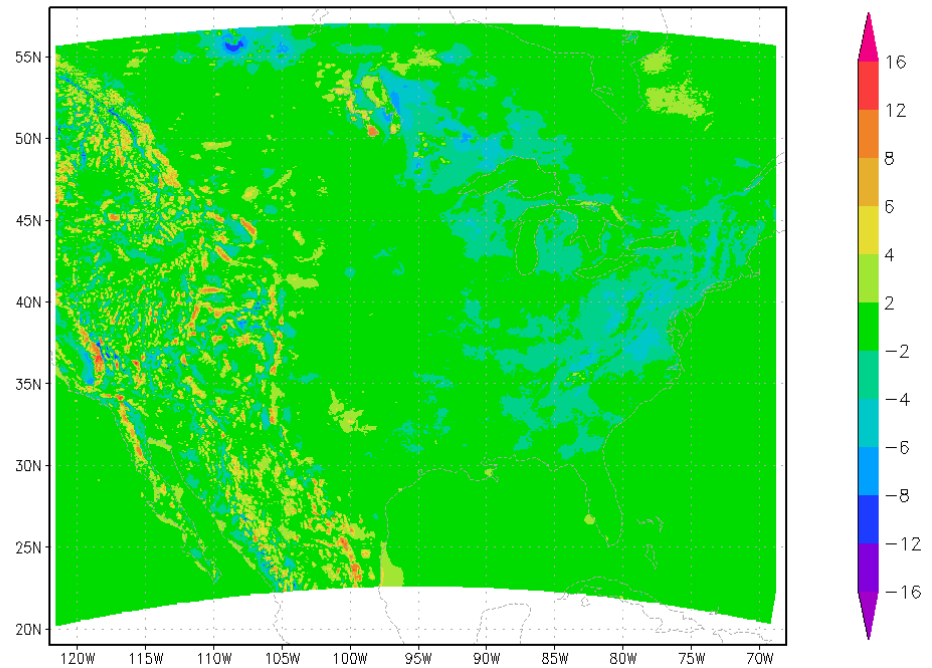
CONUS at 5km
Production at 20150427 00z

CONUS with extended area at 2.5km
Parallel at 20150427 00z

Downscaling Vector for 2m Temp

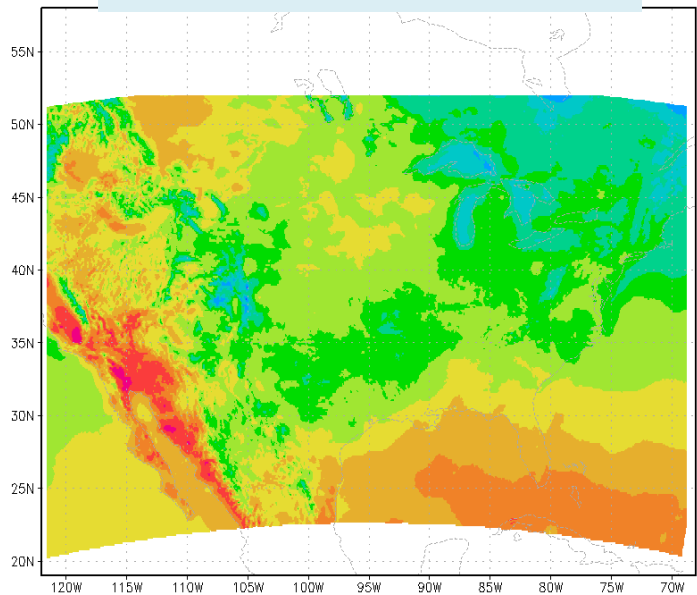


Downscaling Vector for 2m Temp

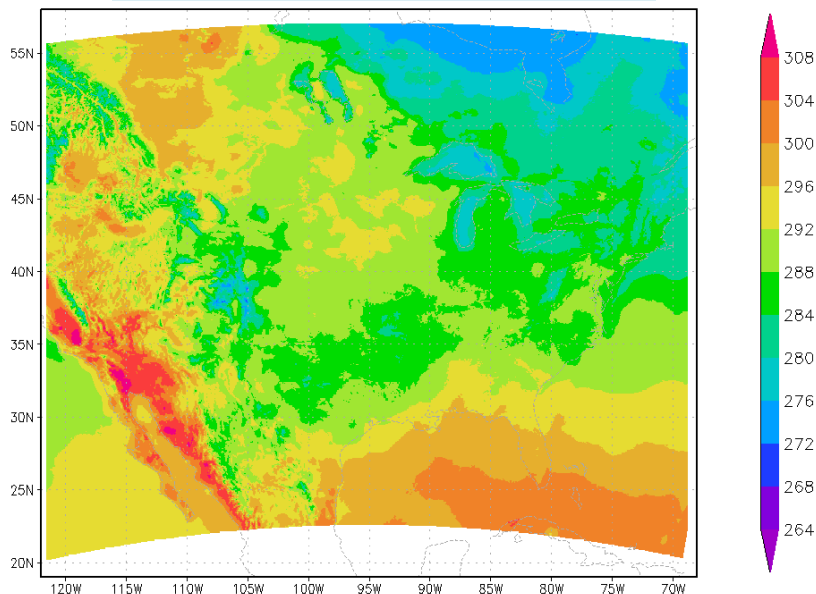


CONUS Downscaled Product Sample Comparison (48hr Fcst)

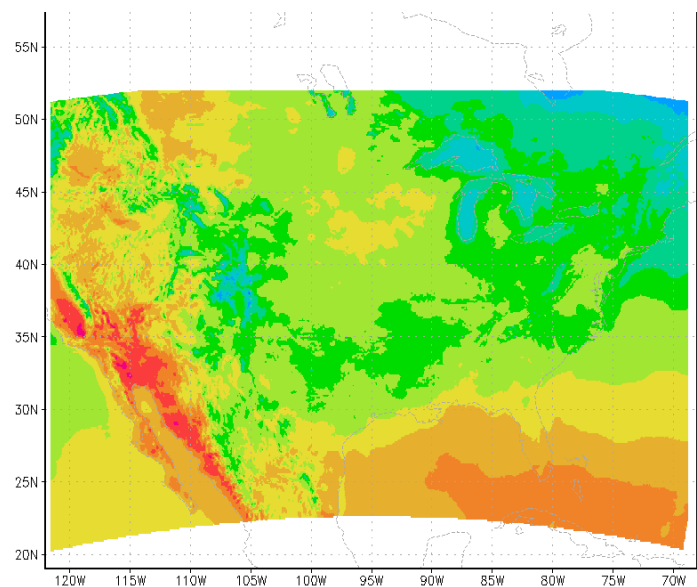
Prod GEFS CONUS at 5km



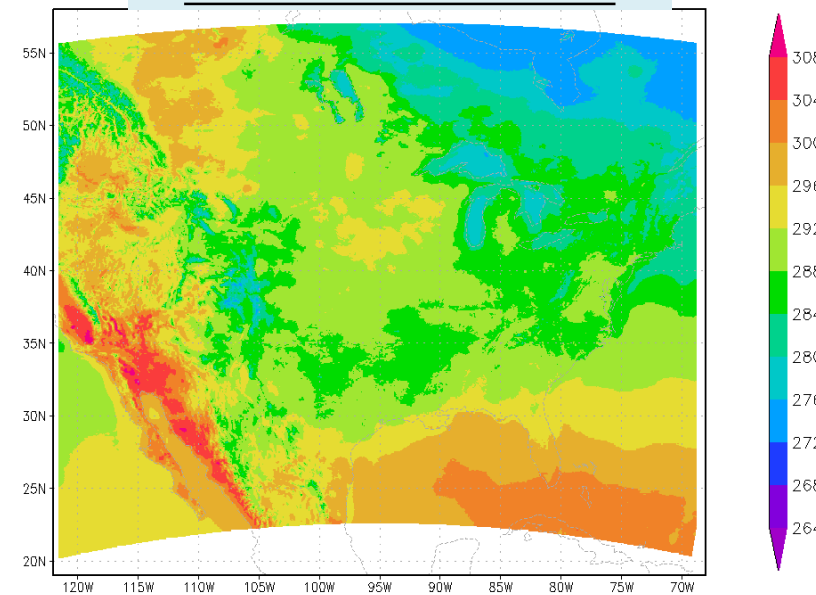
Para GEFS CONUS at 2.5km



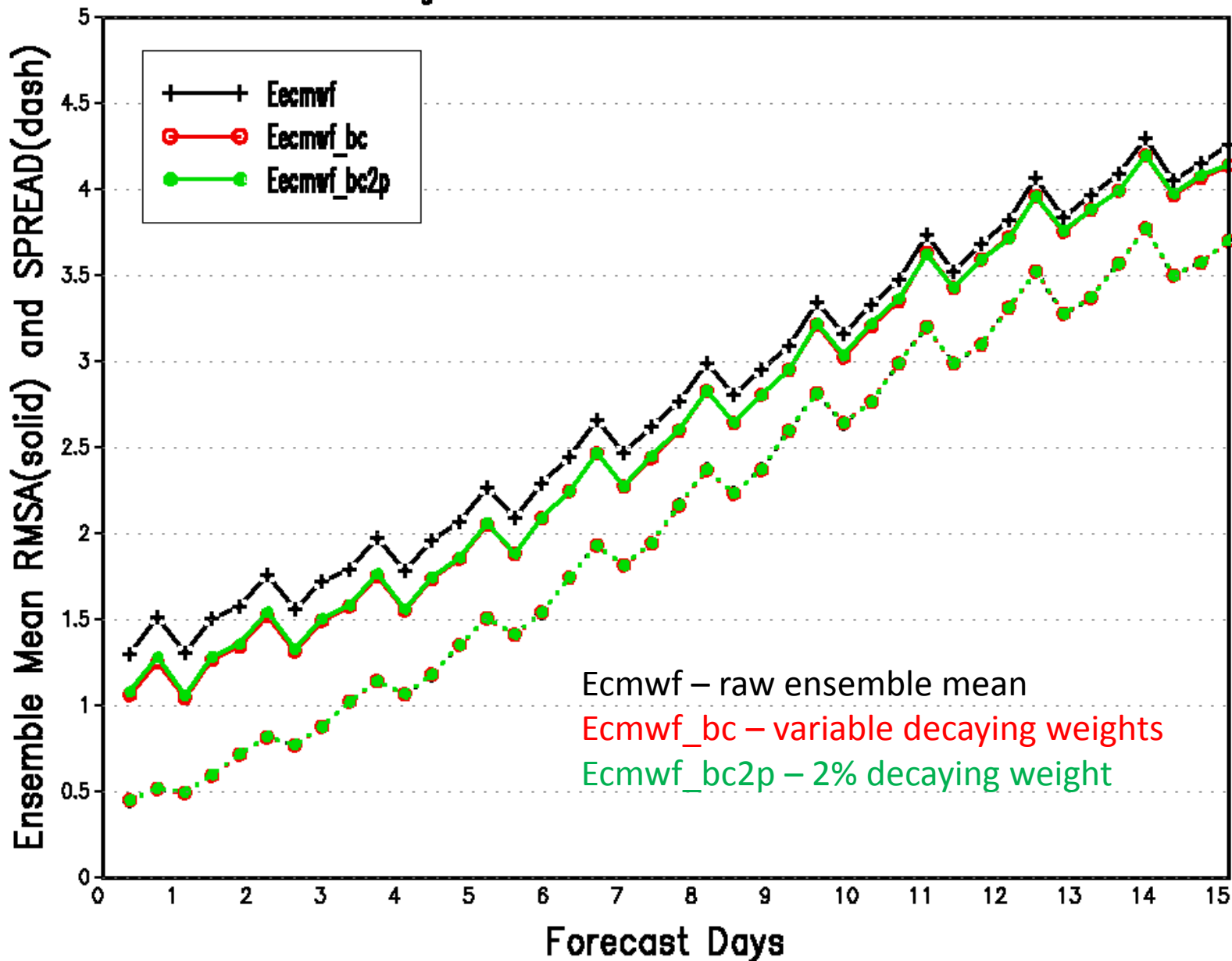
Prod NAEFS CONUS at 5km



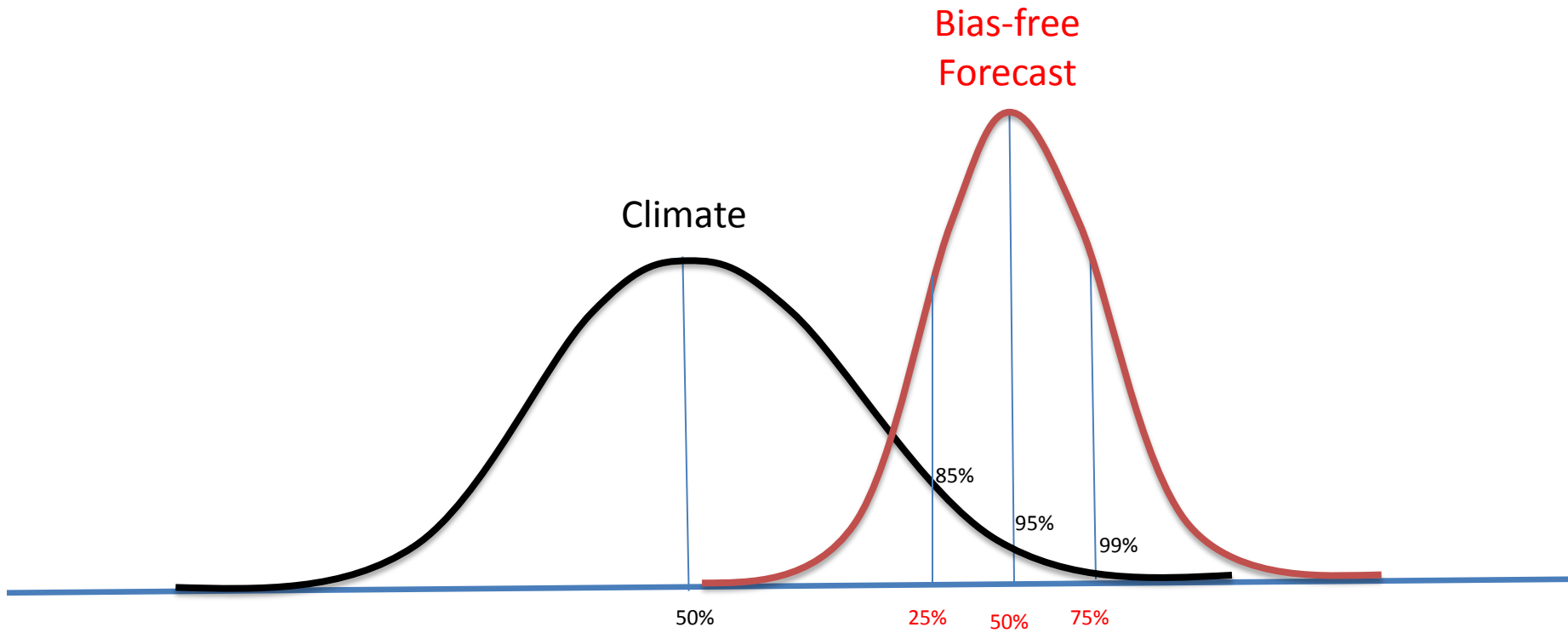
Para NAEFS CONUS at 2.5km



North American 2 Meter Temp.
Ensemble Mean RMSE and Ensemble SPREAD
Average For 2015010100 – 2015030200

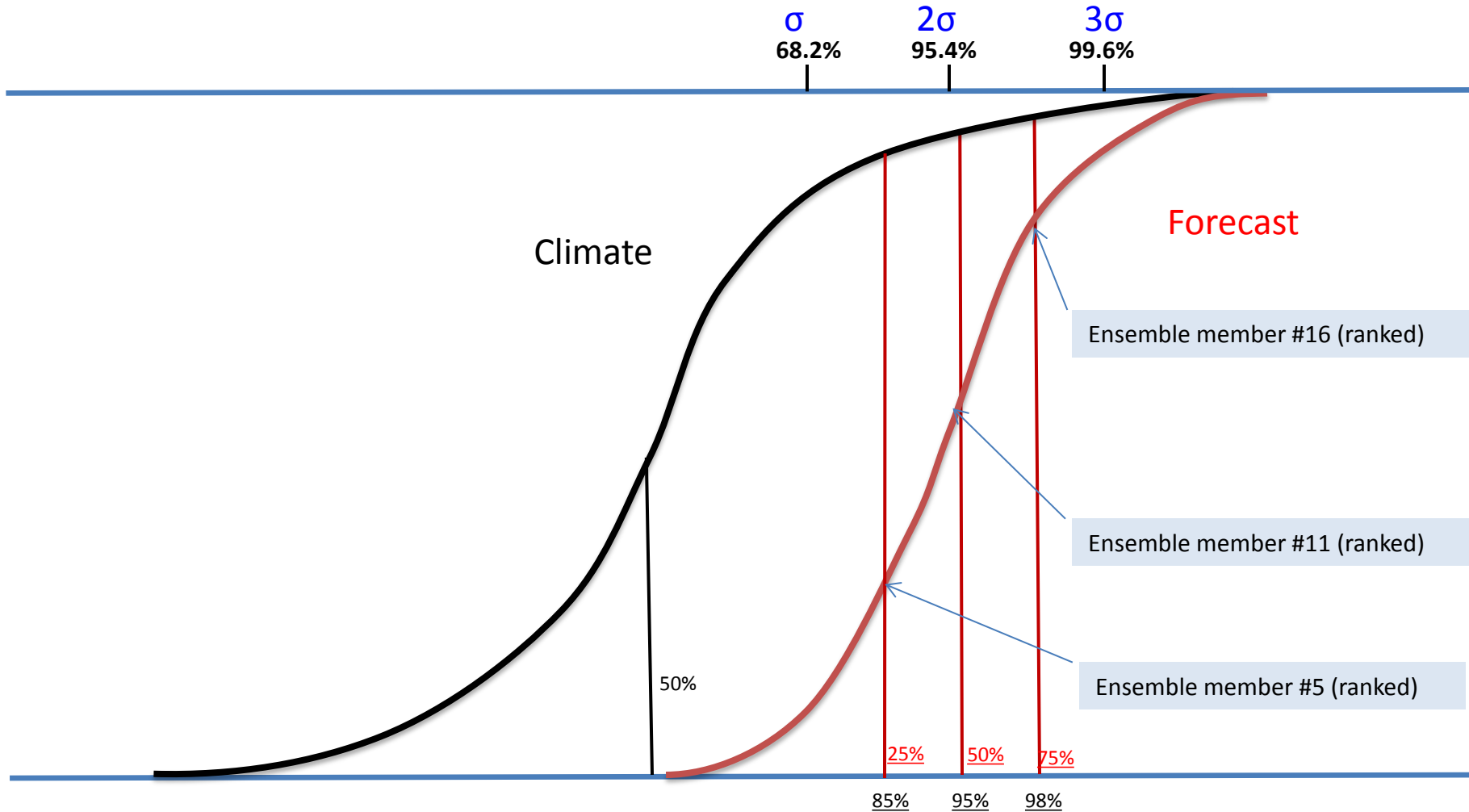


One of GEFS/NAEFS applications



Schematics diagram for anomaly forecast (PDF)

One of GEFS/NAEFS applications

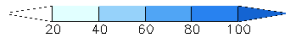
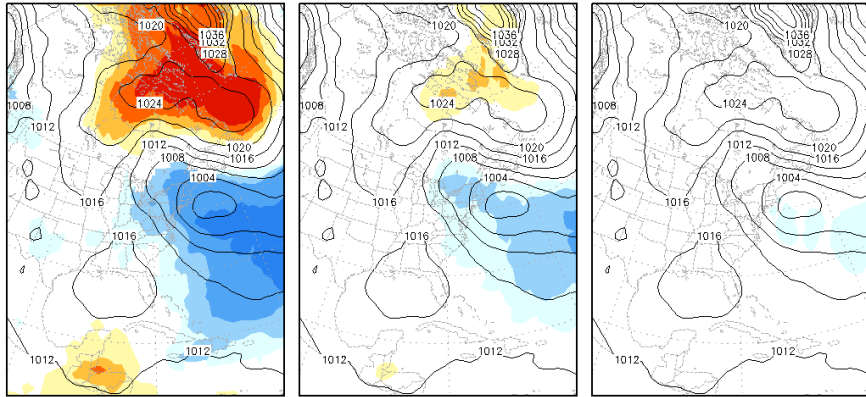


Schematics diagram for anomaly forecast (CDF)

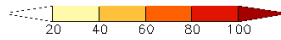
Sea Level Pressure (PRMSL), 192-hour forecast
 Ini. time:2012102300 Valid time:2012103100

Contour—mean forecast; Shaded—forecast anomalies

one stdv two stdv three stdv



8-day fcst

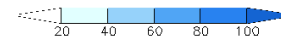
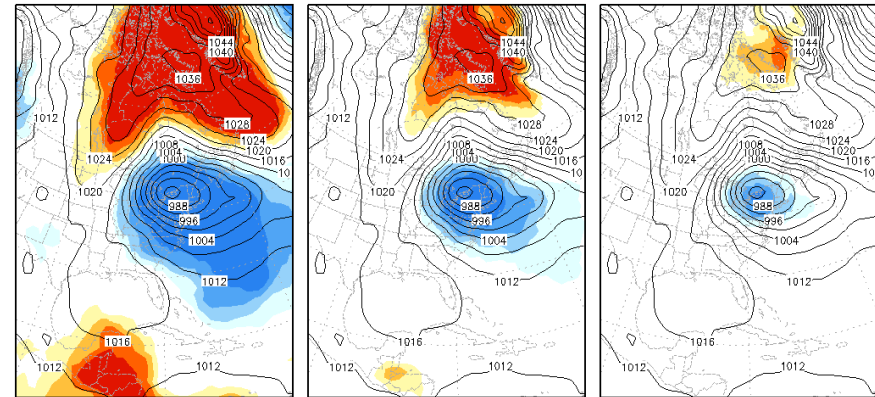


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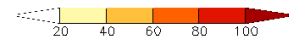
Sea Level Pressure (PRMSL), 144-hour forecast
 Ini. time:2012102500 Valid time:2012103100

Contour—mean forecast; Shaded—forecast anomalies

one stdv two stdv three stdv



6-day fcst

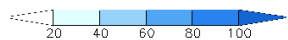
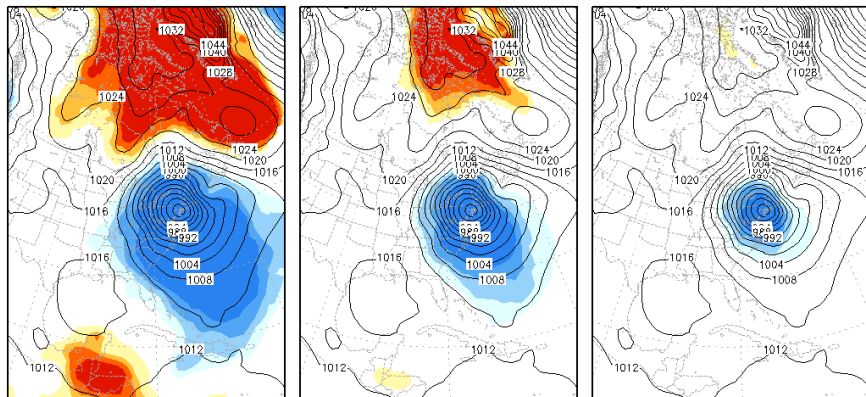


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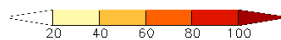
Sea Level Pressure (PRMSL), 120-hour forecast
 Ini. time:2012102600 Valid time:2012103100

Contour—mean forecast; Shaded—forecast anomalies

one stdv two stdv three stdv



5-day fcst

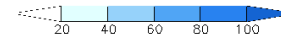
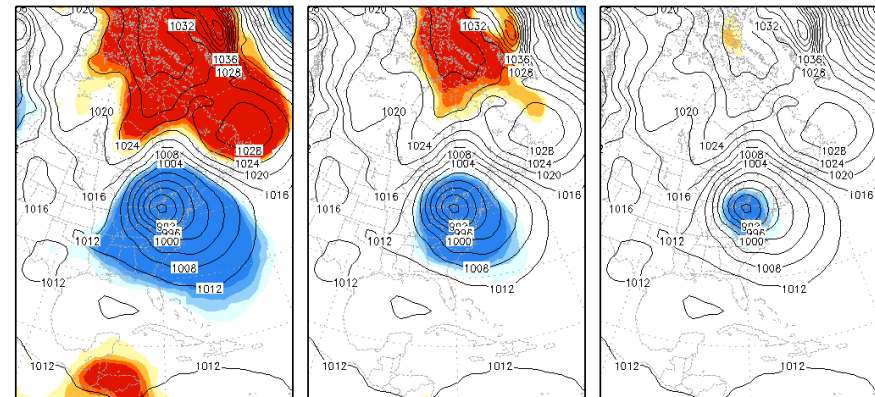


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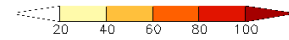
Sea Level Pressure (PRMSL), 96-hour forecast
 Ini. time:2012102700 Valid time:2012103100

Contour—mean forecast; Shaded—forecast anomalies

one stdv two stdv three stdv

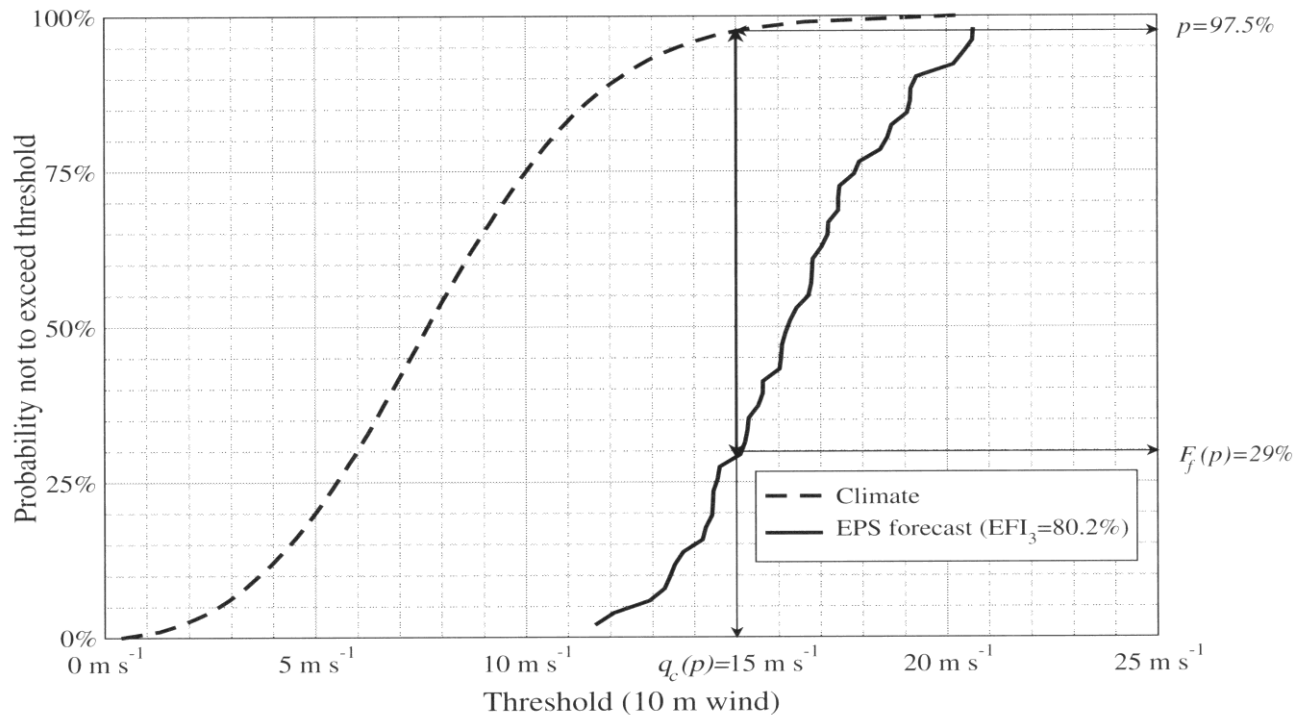


4-day fcst



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Extreme Forecast Index (Lalaurette, 2003)



The EFI is a measure of the difference between the model climatological forecast distribution and the current ensemble forecast distribution.

CDF: cumulative distribution function

Modified equation

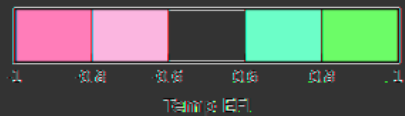
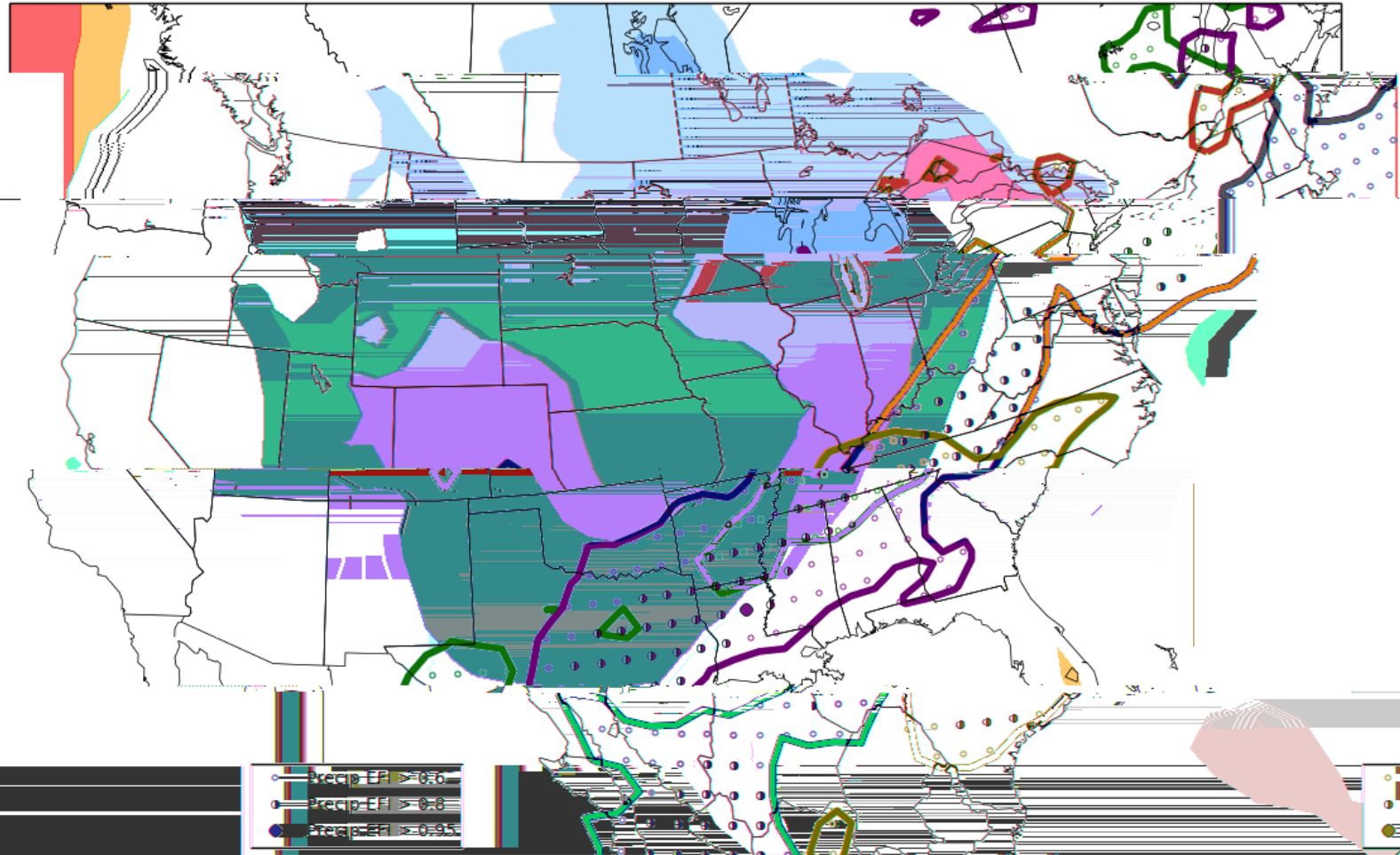
$$EFI = \frac{2}{\pi} \int_0^1 \frac{p - F_f(p)}{\sqrt{p(1-p)}} dp$$

Operational GEFS based EFI (ref: 25 years refcst – ESRL)

072-096hr fcst from 00Z Sun Mar 01. Valid 00Z Wed Mar 04 - 00Z Thu Mar 05

Based on 2nd-Generation GEFS Reforecast.

Extreme Forecast Index (EFI): Accumulated Precipitation, 2m Temperature, 10m Wind



Parallel GEFS based EFI (ref: 18 years refcst – EMC)

T2m(shaded) and V10M(contour) EFI
96hr forecast ini. 2015030100

prcp (shaded) and EFI (contour)
96hr forecast ini. 2015030100

