

CALIBRATION OF PQPF FORECASTS BASED ON THE NCEP GLOBAL ENSEMBLE

THE USE OF LONG-RANGE CLIMATE FORECASTS IN WATER RESOURCES DECISION MAKING

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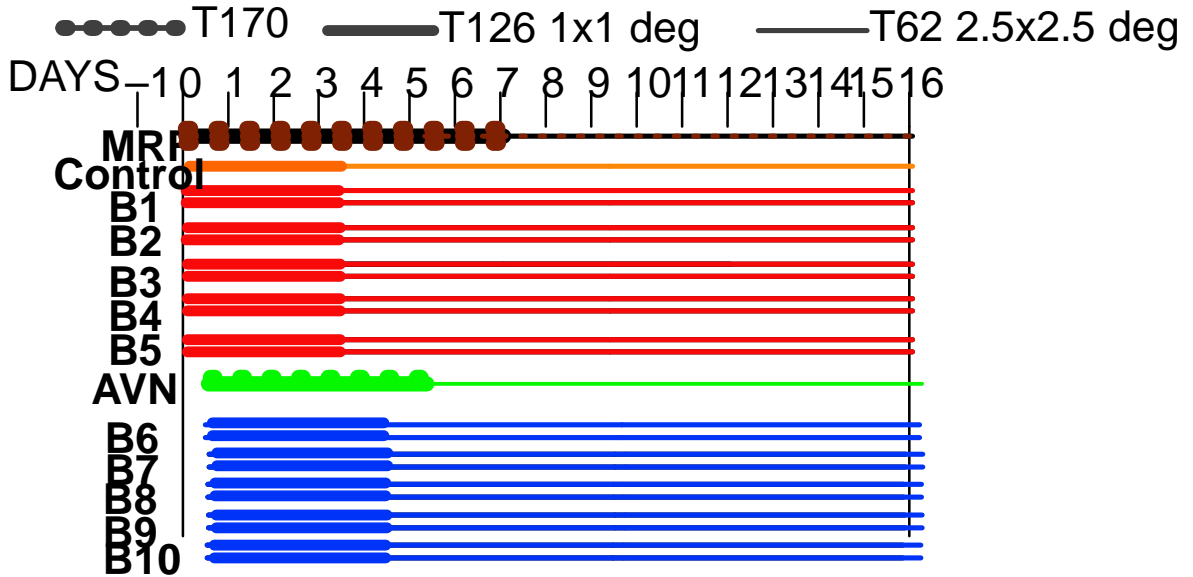
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<http://sgi62.wwb.noaa.gov:8080/ens/enshome.html>

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CALIBRATION OF PQPF FORECASTS

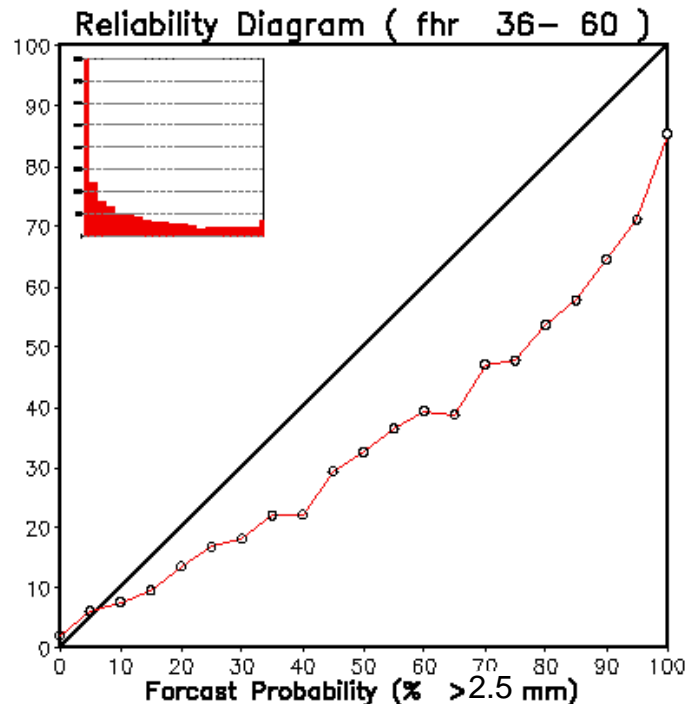
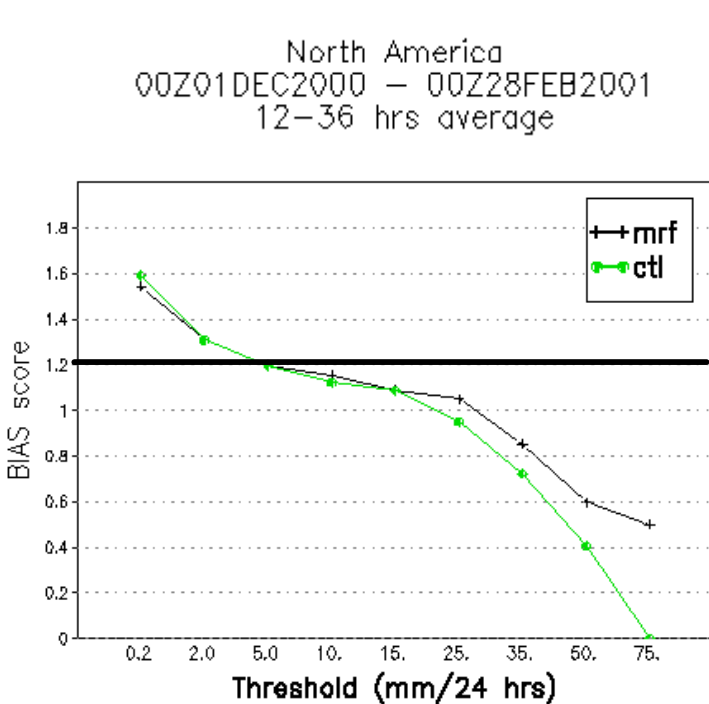
SUBJECT: PQPF based on 20 per day NCEP global ensemble fcsts



Model – Has systematic errors *Ensemble Formation*

PROBLEM:

Ensemble – Model errors not represented *Not perfect*
 => QPF (PQPF) has systematic errors



GOALS:

“Calibrate” PQPF – eliminate bias in prob. fcsts

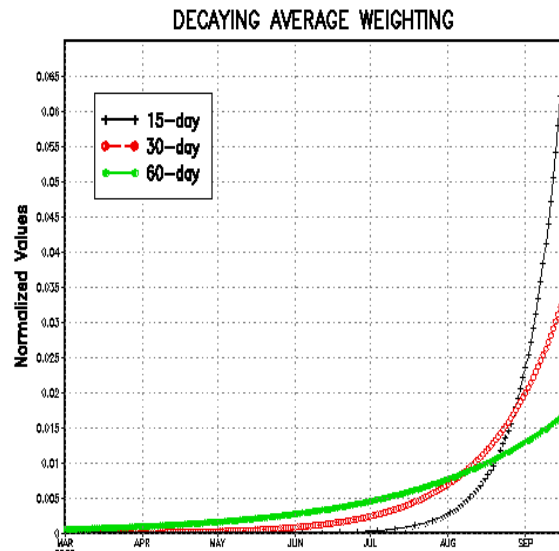
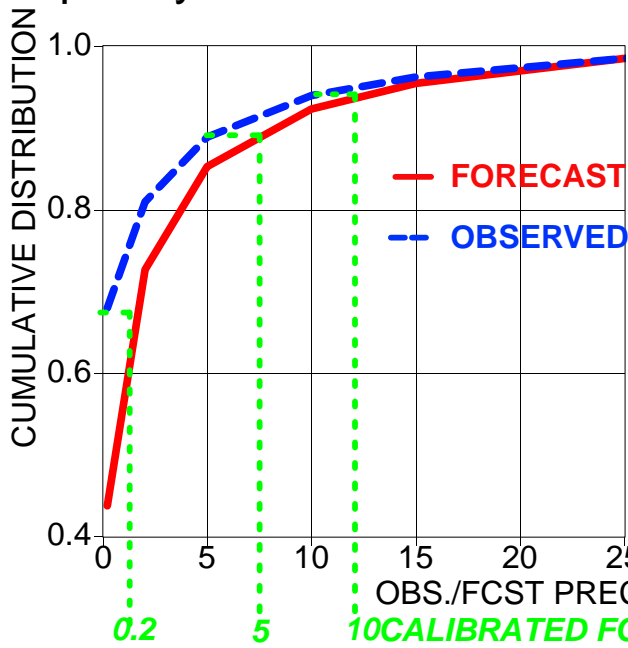
- a) Adjust first moment
- b) Adjust second moment

Provide “traces” (ie., adjusted ens. fcst scenarios)

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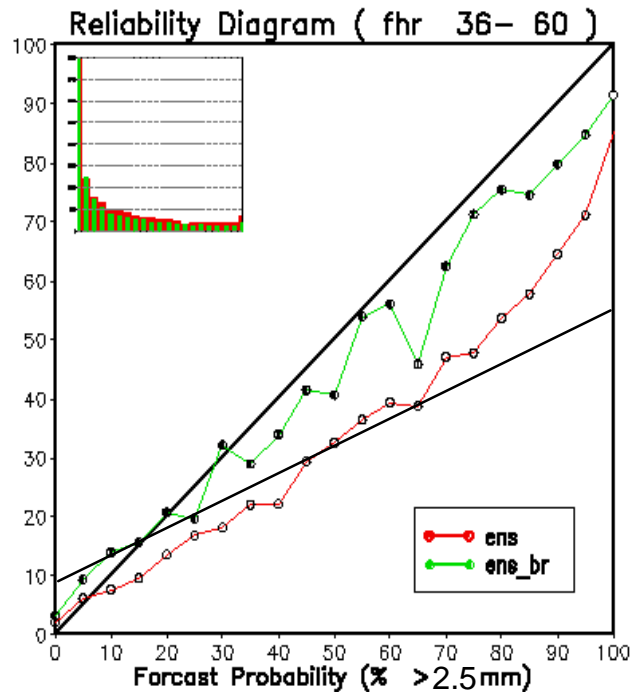
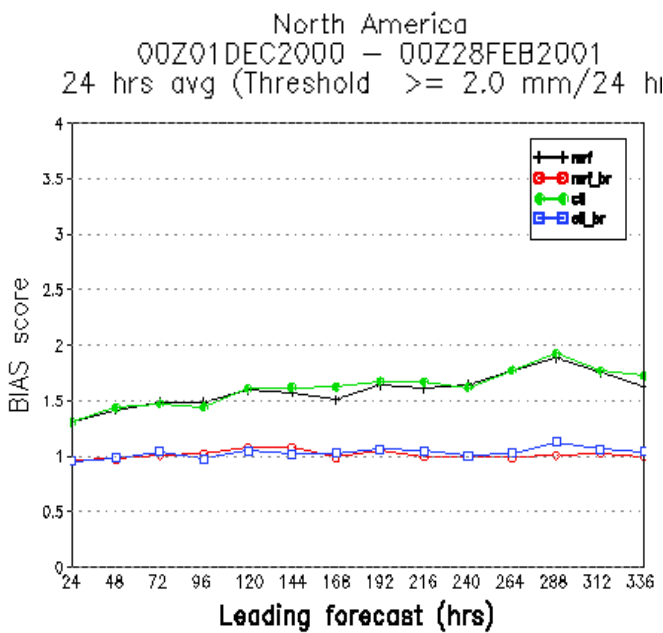
METHODOLOGY:

1) **First moment:** Fcst precip amounts adjusted so their cumulative frequency distribution matches values of observed

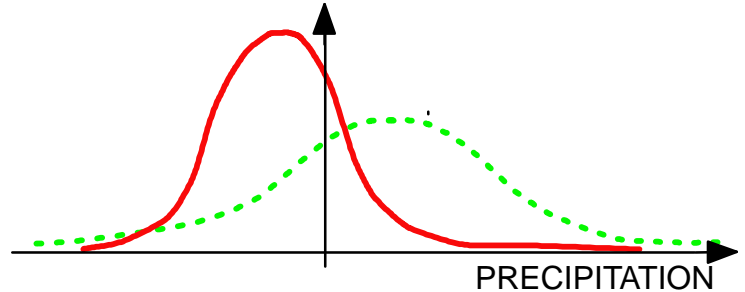


STATS accumulated over: Preceding period, using decaying aver.
 Each gridpoint
 applied on: Each current ensemble fcst member

RESULTS: First moment bias removed
 Second moment bias reduced



2) **Second moment:** “Normalized” spread in individual ens fcsts is adjusted so their composite cumulative frequency distribution matches that of corresponding observations



ISSUES: Normal distribution assumed (after transformation?)

Zero amounts treated as “virtual negative”

Zero fcst adjusted if necessary for members with highest RH

Sampling noise vs. need for details balanced

EXPECTED RESULTS: First moment retained
Second moment bias further reduced/elimin.

ADVANTAGES:

Flexible: Global or regional (by combining gridpoint stats)
Station or various gridbox size application
Retains higher moments in fcst data if skillful
Traces provided (for joint probability distributns)

Oper. feasible: Data requirements
Computational process managable
Adaptive, “learns” changes in model behavior

PLANNED APPLICATIONS:

Global adjst. (based on US data) tested over South Africa (W. Tennant)

Local adjustment tested over selected US region (M. Kane)

PRIOR WORK: Eckert, Hamill

FUTURE:

Develop/test neural network calibration algorithm?

Use experience gained through calibration in project to:

**REDUCE/ELIMINATE NEED FOR POSTPROCESSING BY
EQUIPPING THE MODEL USED IN ENSEMBLE FCSTING TO
REPRESENT MODEL RELATED UNCERTAINTY**

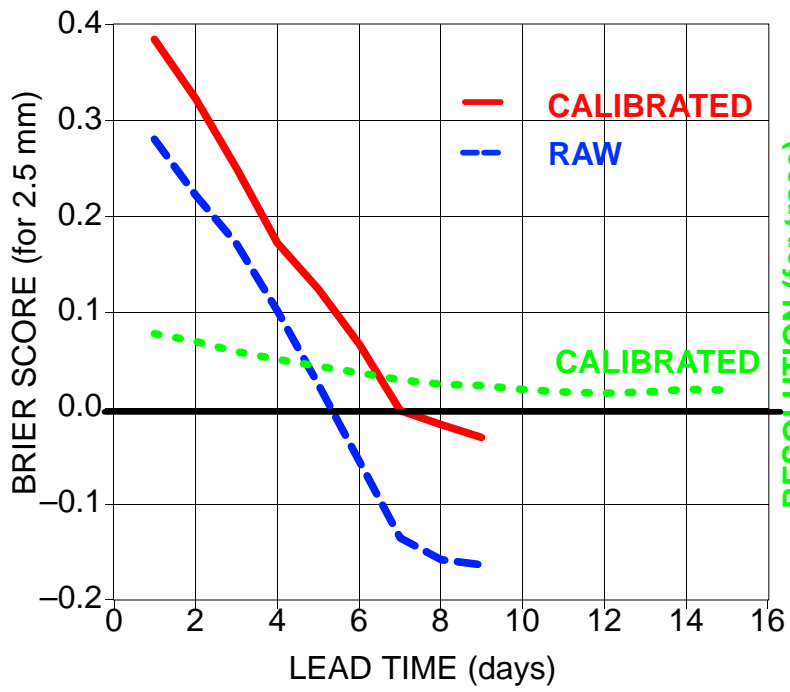
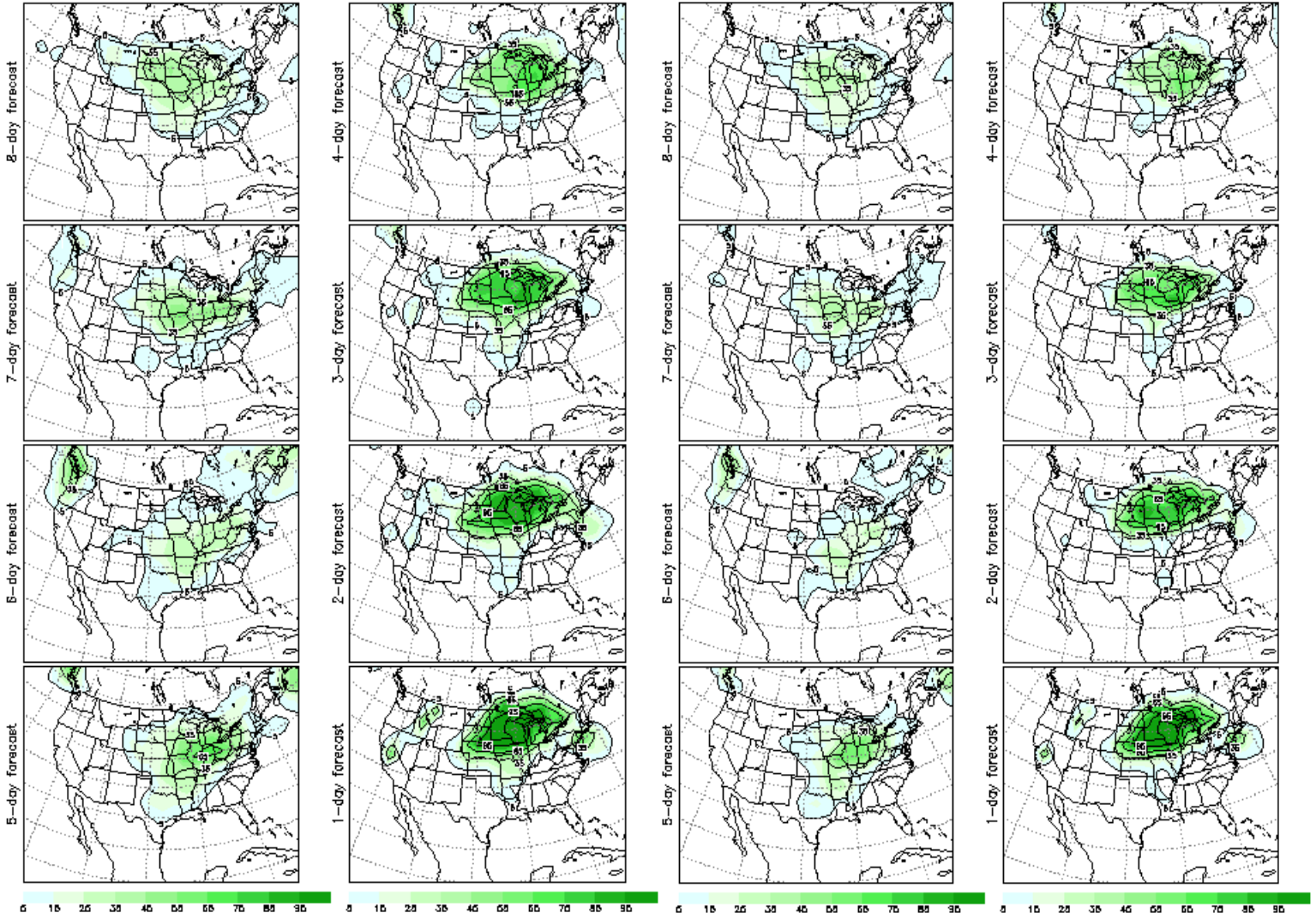
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Ens Prob of Precip Amount Exceeding 0.5 Inch (12.7 mm/day)

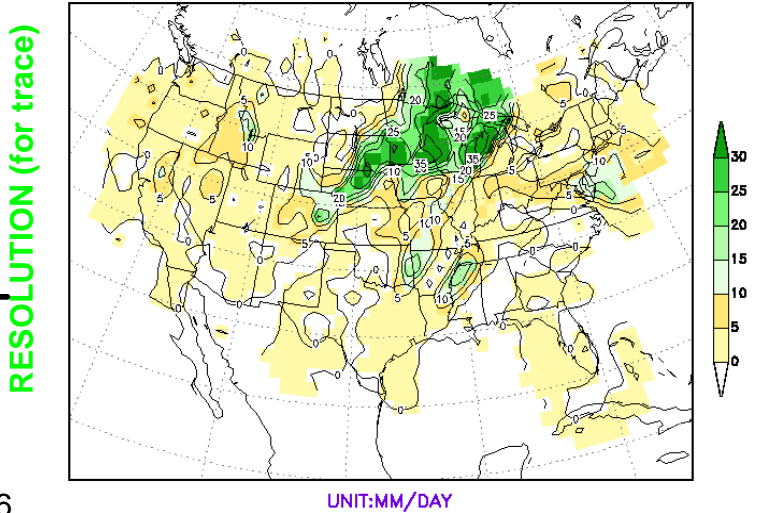
Valld Period: 2001041112-2001041212

RAW

CALIBRATED



24 hours accumulated precipitation by end of 2001041212



UNIT:MM/DAY