

The Environmental Modeling Center's Model Evaluation Group

Glenn White, Geoffrey Manikin, Corey Guastini*

Environmental Modeling Center

NCEP/NWS/NOAA

US. Department of Commerce

College Park, MD

Glenn.White@noaa.gov

*IM Systems Group, Inc



**Inspired by monitoring activities at ECMWF,
Met Office, GMAO**

**MEG developed after months of discussions
and review by members of EMC, NCO, WPC**

**Examines model performance from
perspective of forecaster and provides
verification**

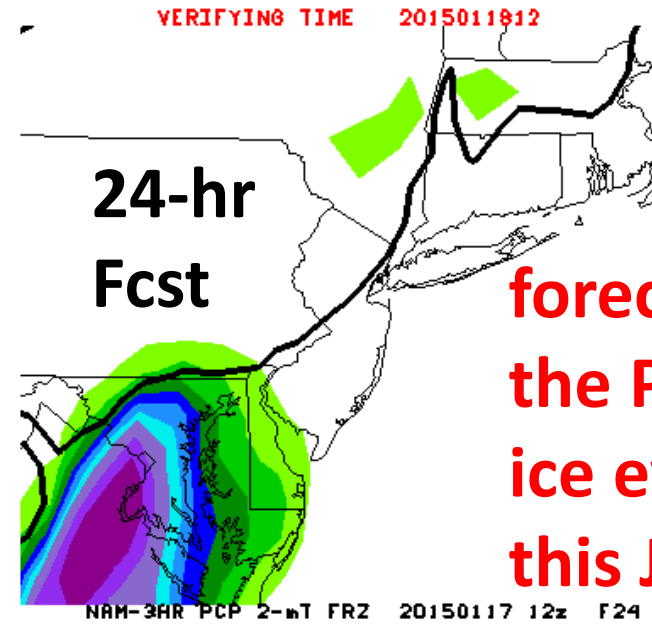
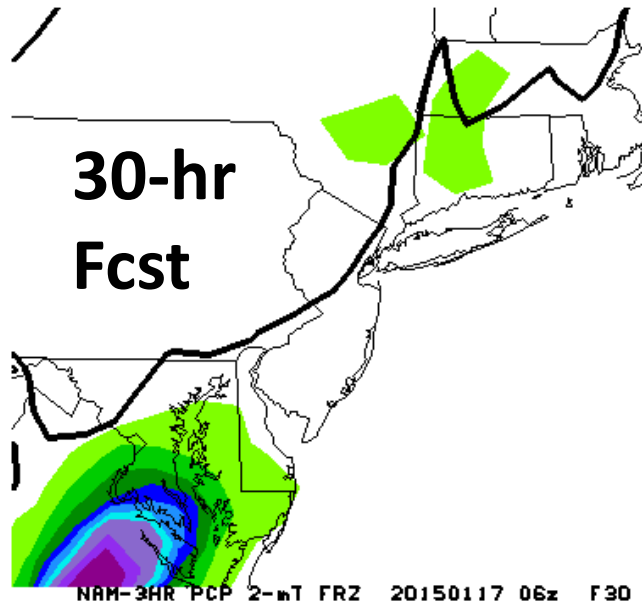
Enhances synoptic verification within NCEP

Model Evaluation Group (MEG)

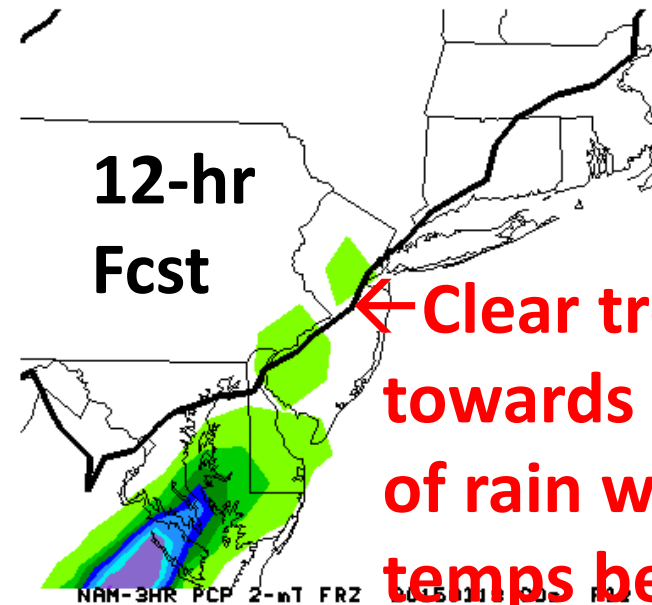
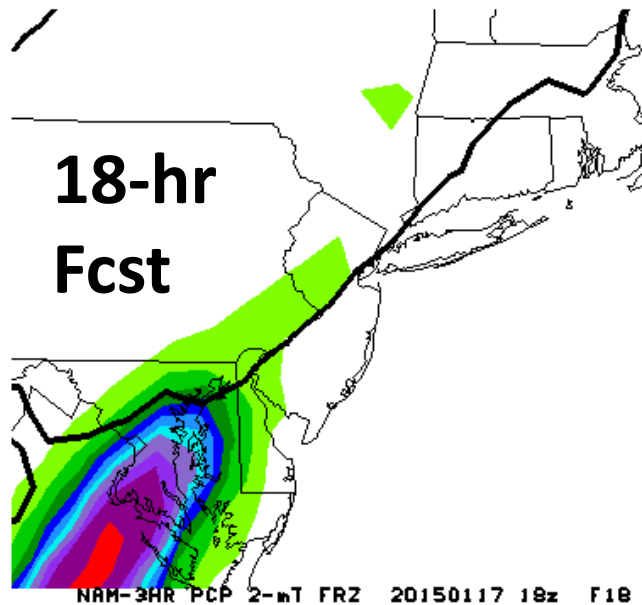
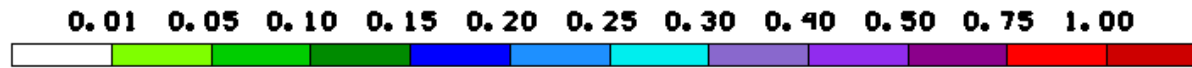
**proven entity with 3 years of enhancing
communication among EMC and the field**

- **Weekly briefing of model performance, synoptic emphasis, also statistics, time means**
- **Organized evaluation of EMC parallels and experiments**
- **Critical feedback to developers**
- **Updates users regarding model changes and issues**
- **Listens to users' feedback**
- **Rapidly generates critical case studies (e.g. 2012 Mid-Atlantic derecho, 2013 El Reno tornado/OKC flooding, 2015 PHL-NYC snow forecast bust, ATL/BHM Jan 2014 commuter disaster, Superstorm Sandy....)**

NAM



forecasts for
the PHL-NYC
ice event
this January.

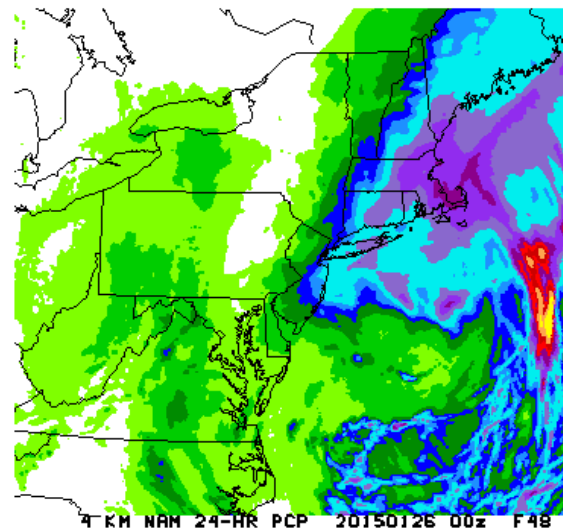
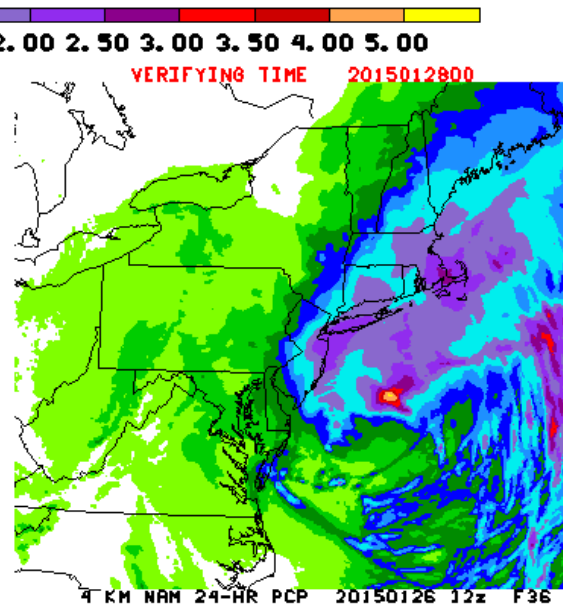
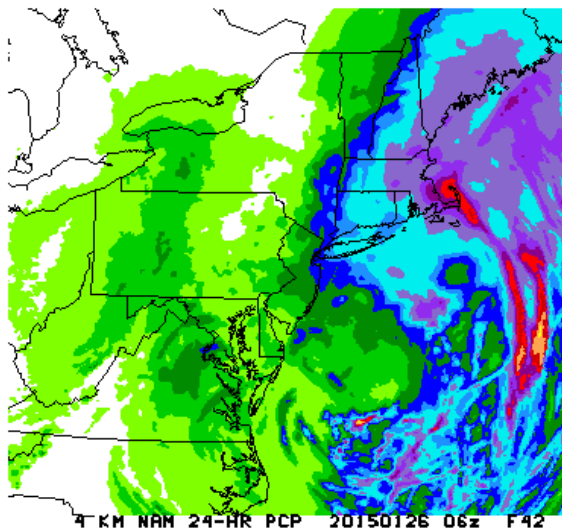
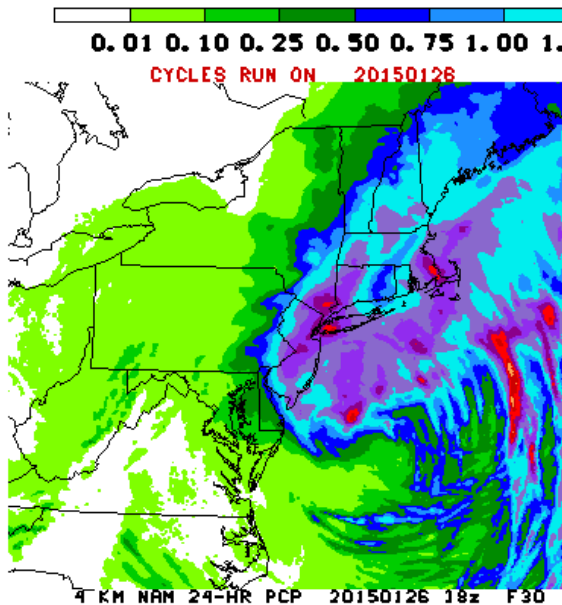


← Clear trend
towards a period
of rain with sfc
temps below frz

**NAM NEST
24 hr
Precip
forecast**

**30 hr
forecast**

**42 hr
forecast**



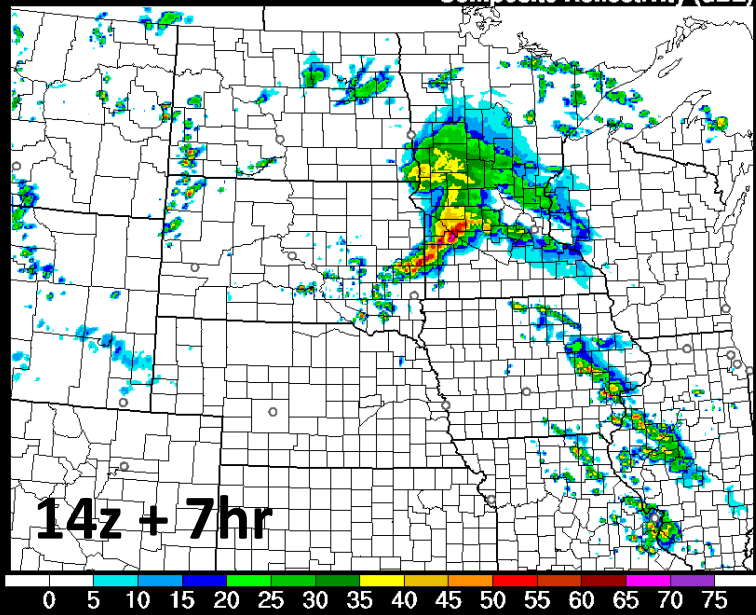
**36 hr
forecast**

**48 hr
forecast**

NYC snow overforecast

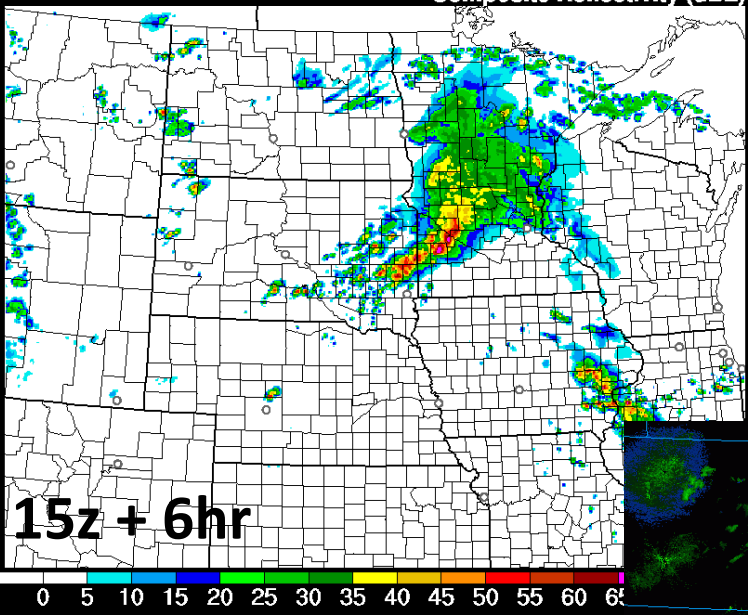
HRRR 06/16/2014 (14:00) 7h fcst - Experimental

Valid 06/16/2014 21:00 UTC
Composite Reflectivity (dBZ)



HRRR 06/16/2014 (15:00) 6h fcst - Experimental

Valid 06/16/2014 21:00 UTC
Composite Reflectivity (dBZ)

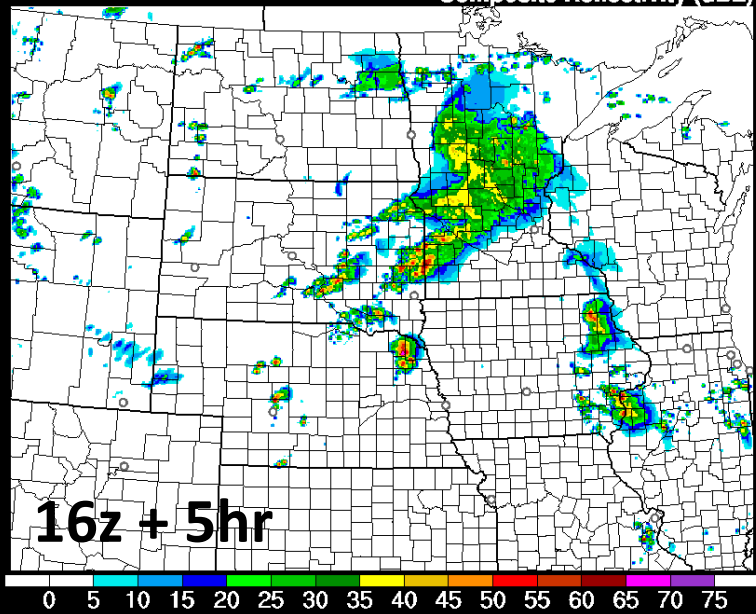


**Clear trend
in hourly
HRRR for
enhanced
risk in
northeast NE**

June 16, 2014 twin tornado supercell in northeast NE

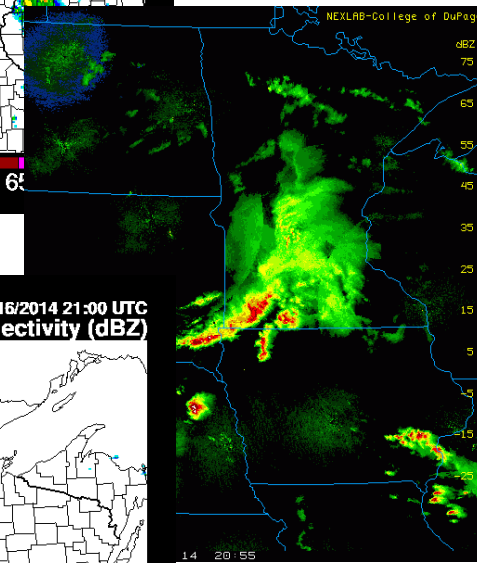
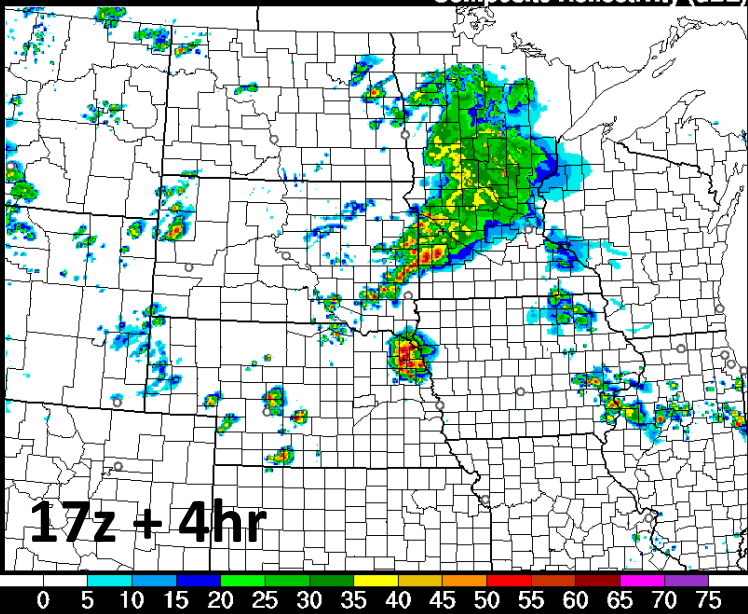
HRRR 06/16/2014 (16:00) 5h fcst - Experimental

Valid 06/16/2014 21:00 UTC
Composite Reflectivity (dBZ)



HRRR 06/16/2014 (17:00) 4h fcst - Experimental

Valid 06/16/2014 21:00 UTC
Composite Reflectivity (dBZ)



- **Participation and presenters from other NCEP centers, NWS regional/local offices, ESRL**
- **Transitioned to Webinars early this year thanks to Southern Region in response to increased remote participation from NWS regional and local offices**
- **Model changes already implemented, being tested in response to MEG concerns**

***In late spring 2012 MEG noted
late afternoon moist bias in GFS
(especially over mid-west US)***

***Associated cold bias seen in summer
—most evident in hot air masses***

***EMC aware of it by time forecasters noticed
Implemented correction in late summer 2012***

120723/0000 74455 DVN
120723/0000 74450

CAPE: 48
CAPE: 1276

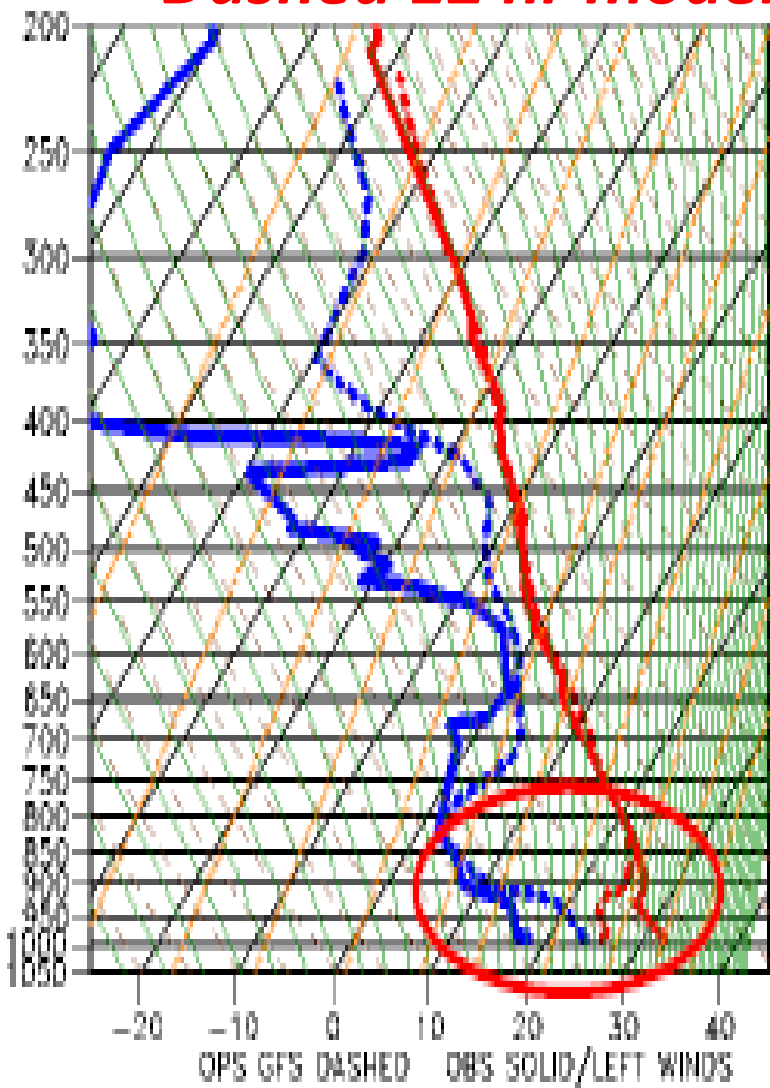
Operational

120723/0000 74455 DVN
120723/0000 74450

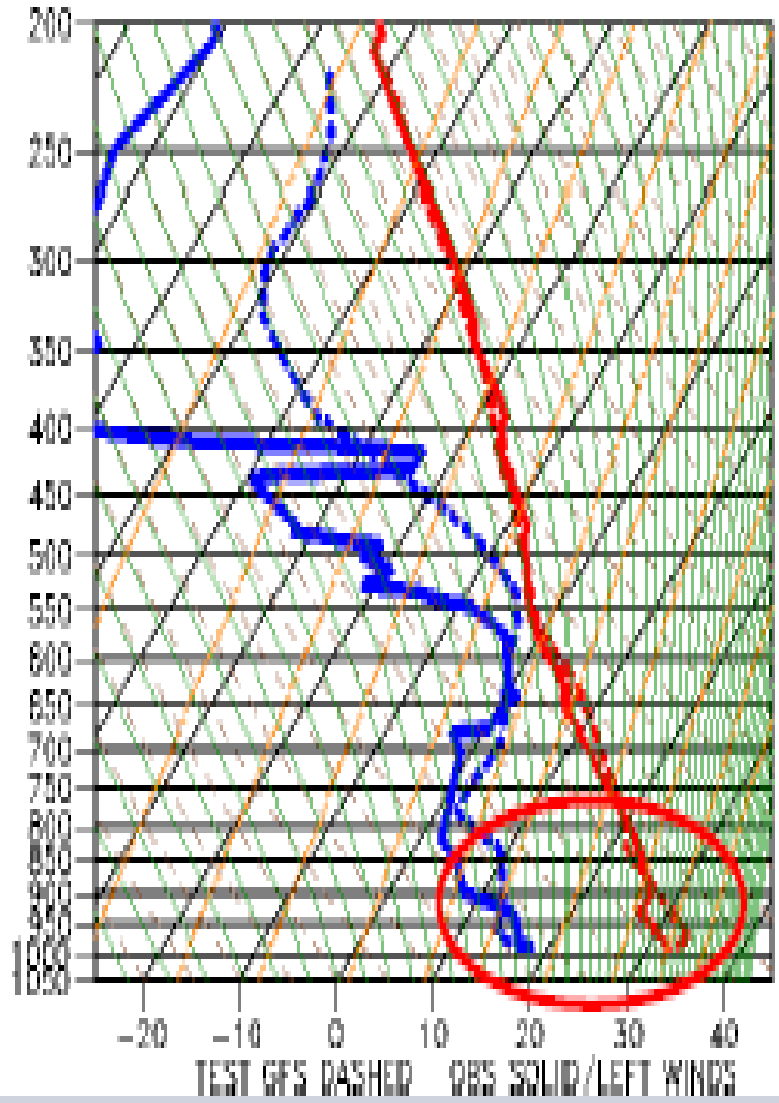
CAPE: 48
CAPE: 71

Experimental

Dashed 12 hr model forecasts Solid observed



Handwritten notes in Arabic script, including the word 'ملاحظة' (Note) and 'البيانات' (Data).

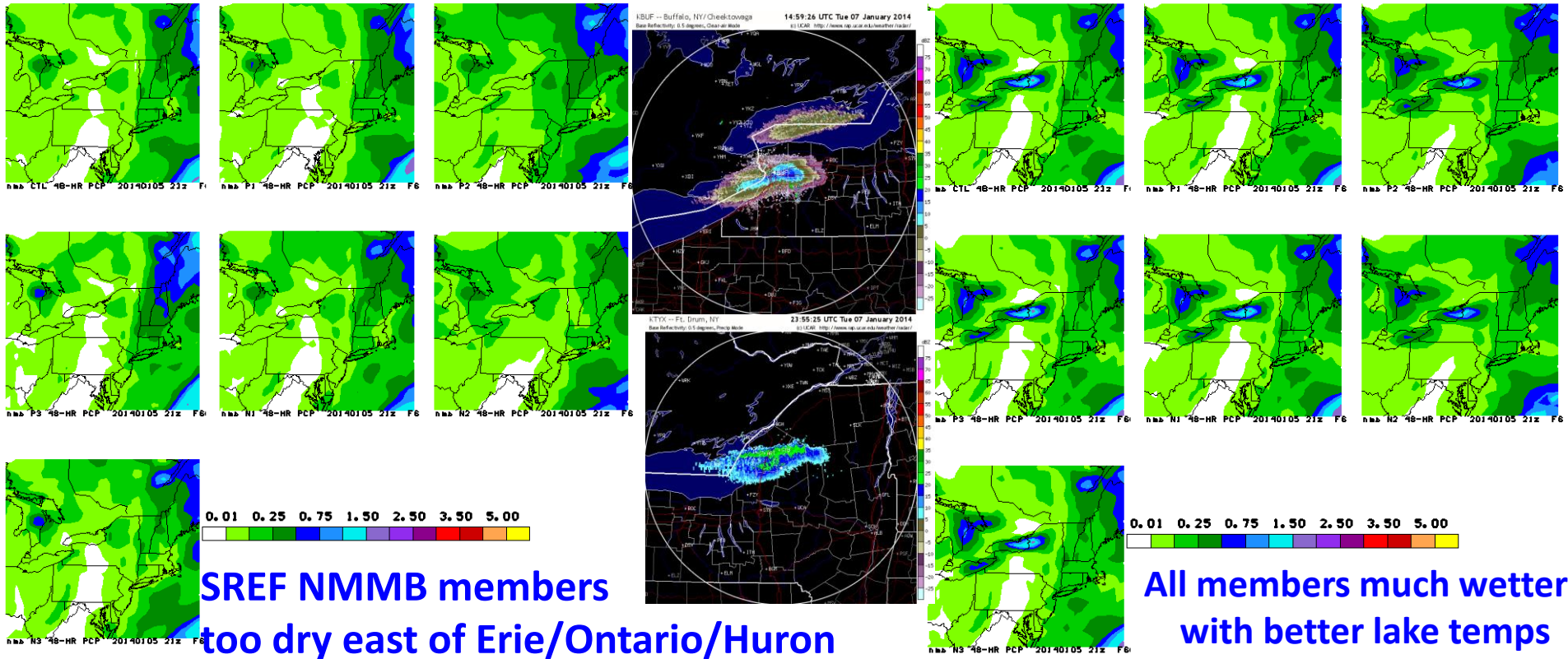


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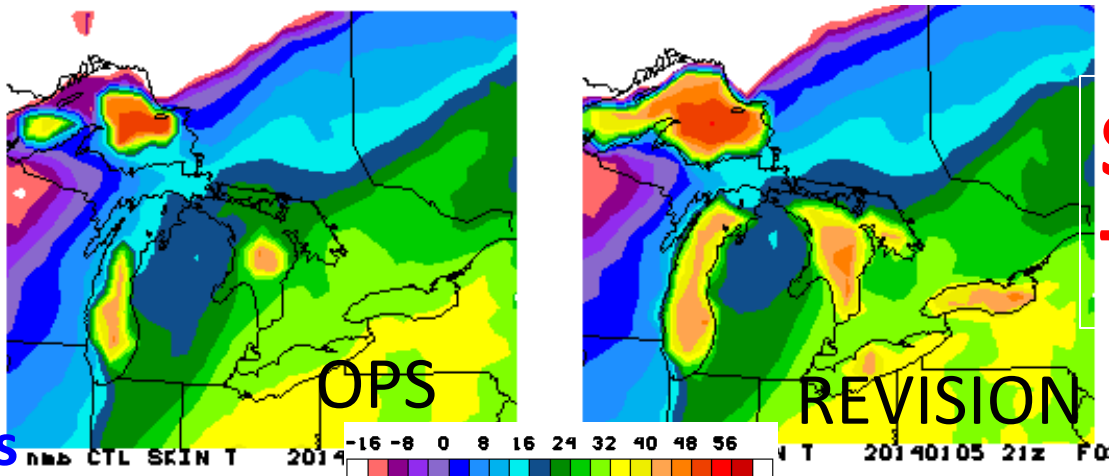
GFS soundings for Davenport, Iowa 02 July 23, 2012

G. Manikin

SREF Great Lakes Temperature Initialization



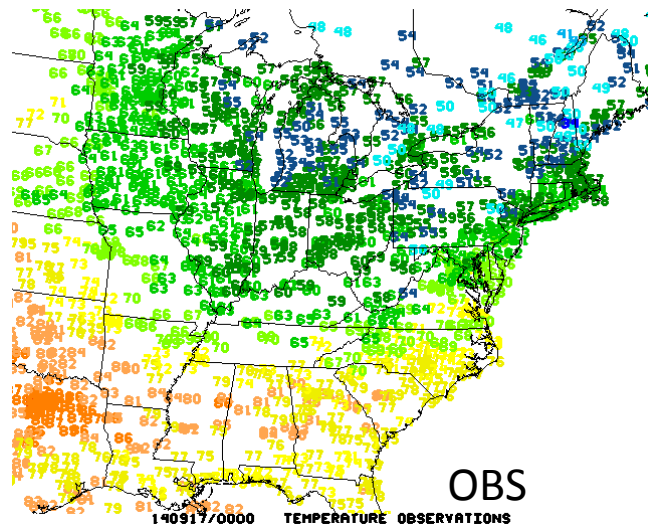
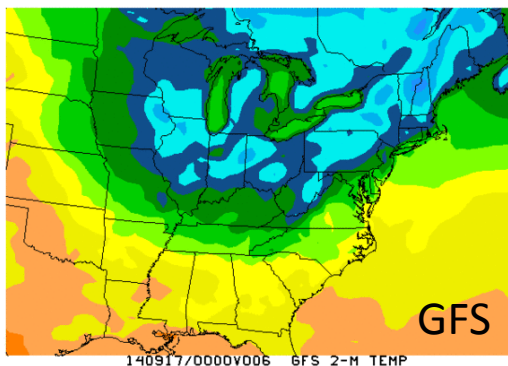
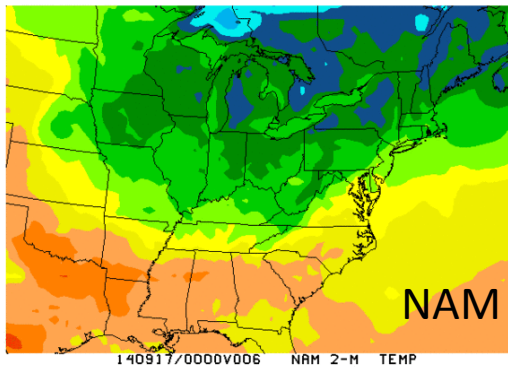
Those lakes incorrectly frozen in NMMB initial conditions



SKIN TEMPS

GFS Problems

Late afternoon 2 m cold, wet bias in eastern US
2m temps can plummet between 21 and 0z
--collapse of boundary layer
--reduction to 2m

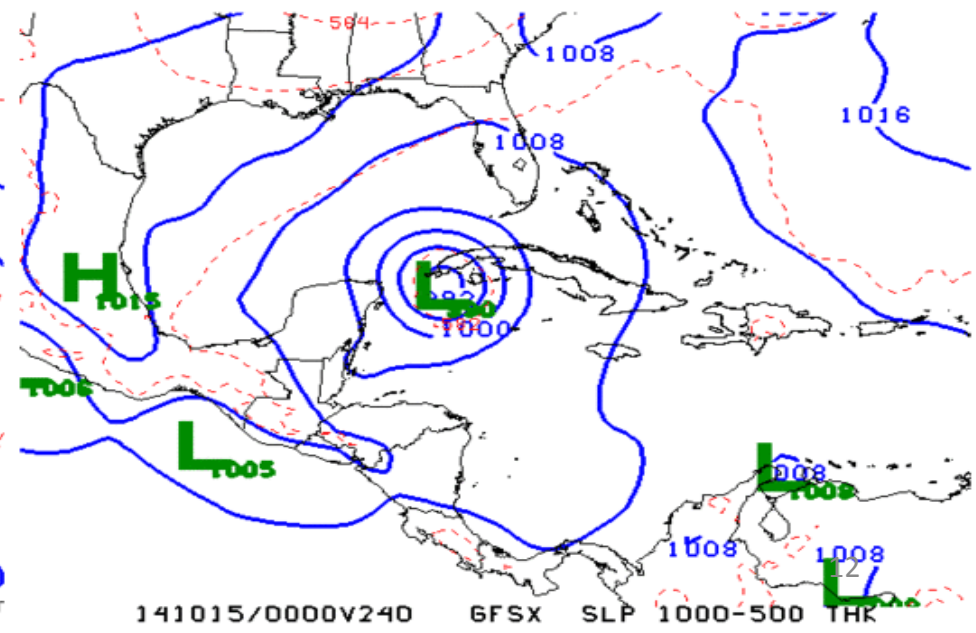
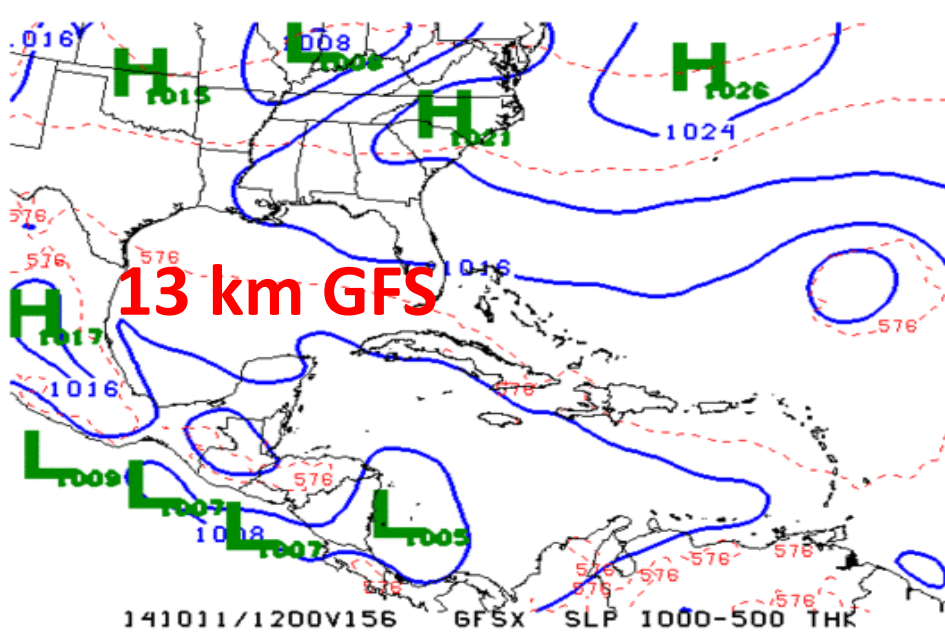
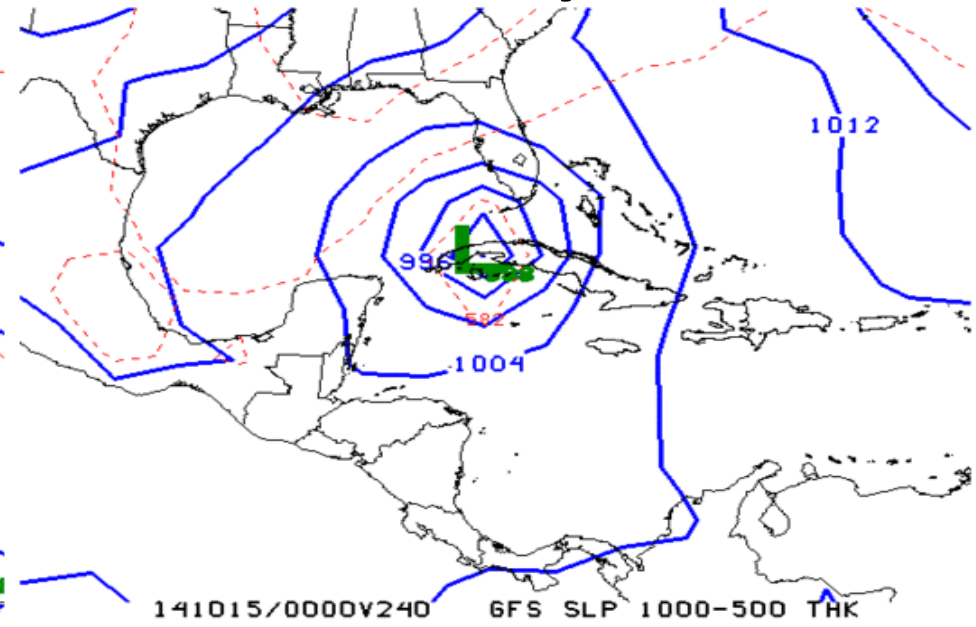
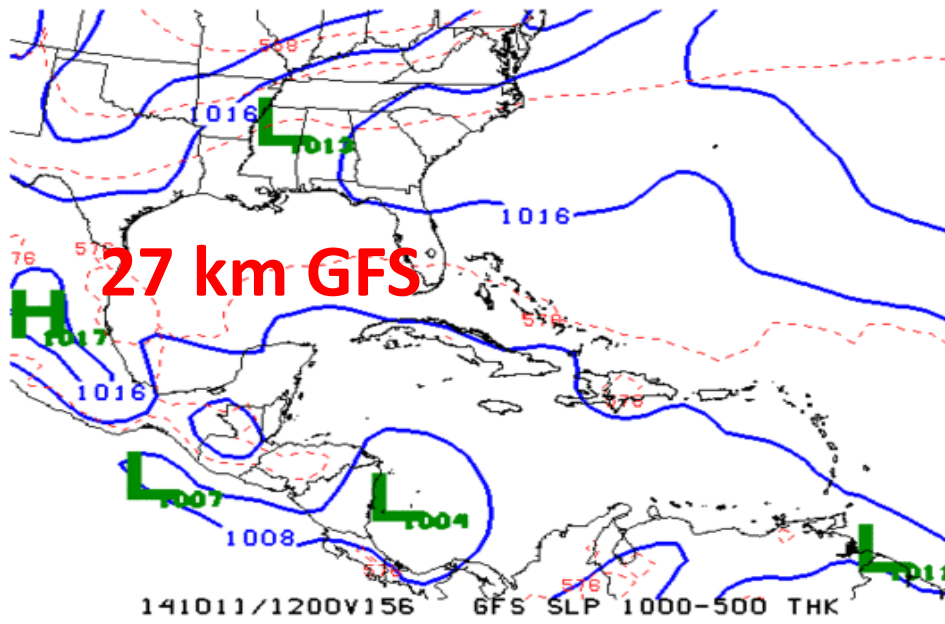


EMC Land-Sfc Team
testing modifications
to roughness length
to reduce exchange
coefficient and
hopefully limit
decoupling – modest
success thus far

Forecast from 00Z Oct. 5 example of bogus tropical storms

6.5 day forecasts

10 day forecasts

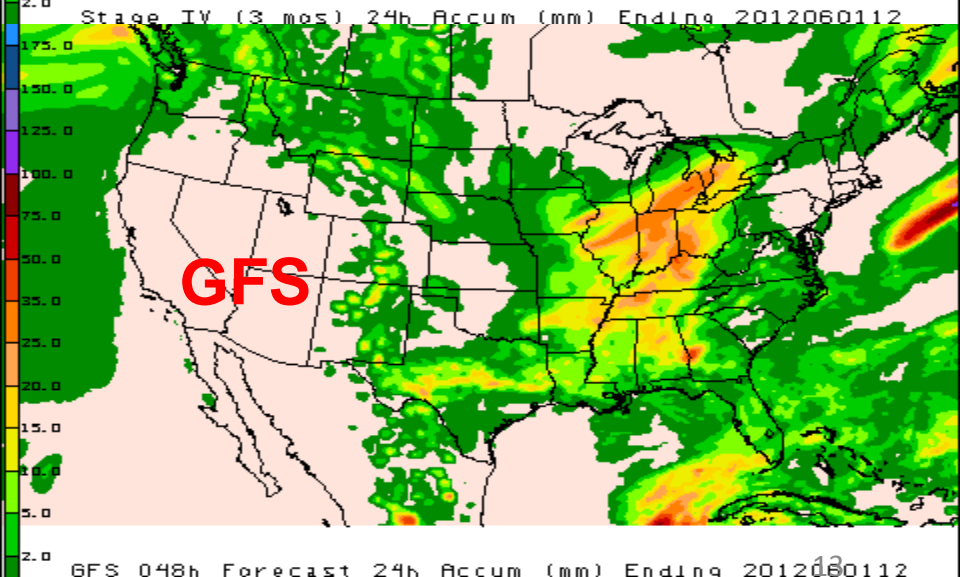
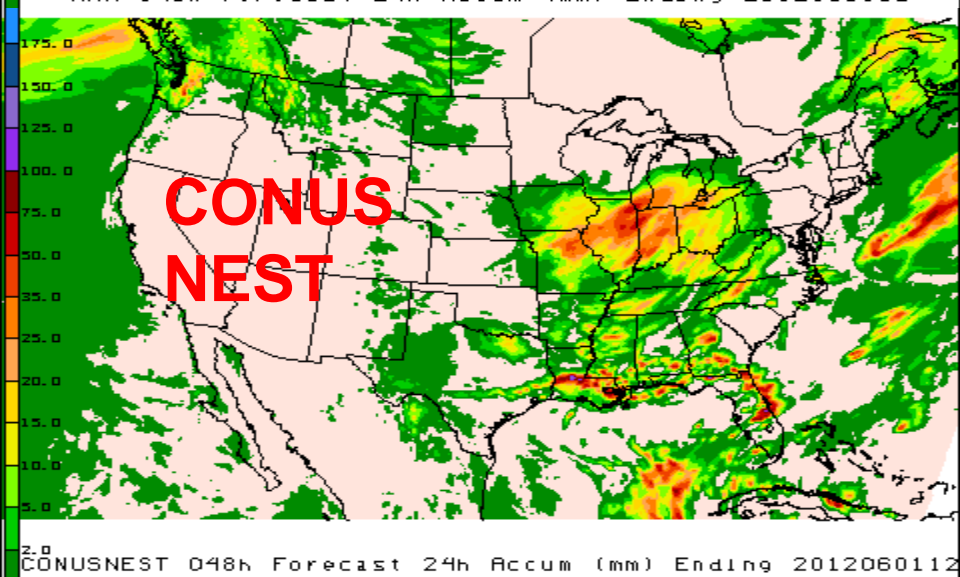
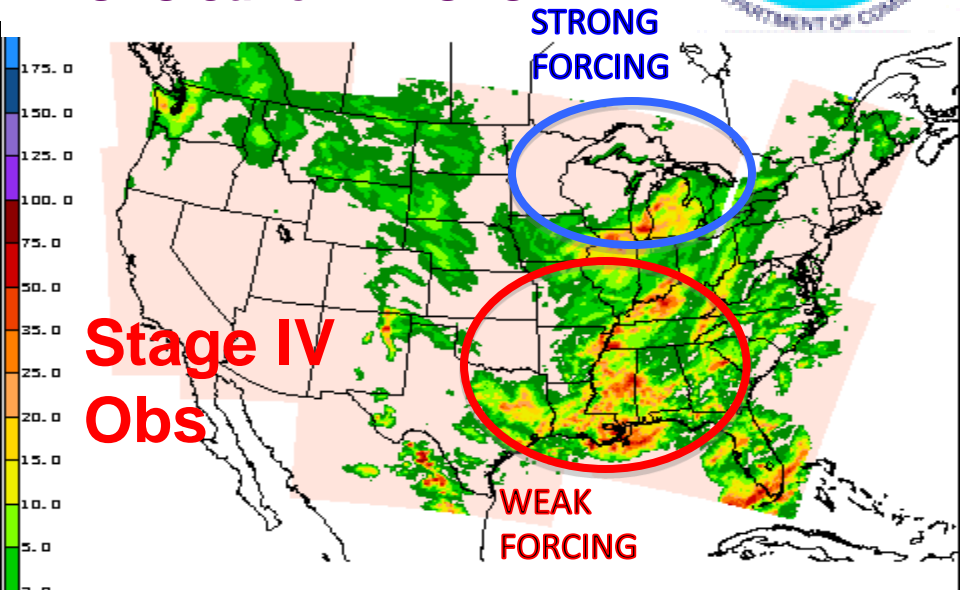
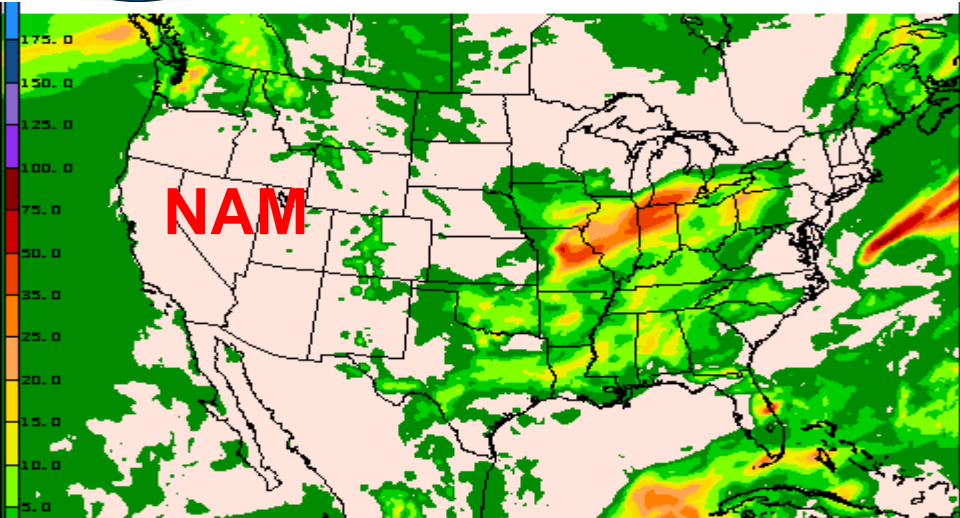




EXAMINATION OF NAM WARM SECTOR LOW PRECIP BIAS



24-48 hr precip for May 31 12 UTC-June 1 12 UTC



NAM

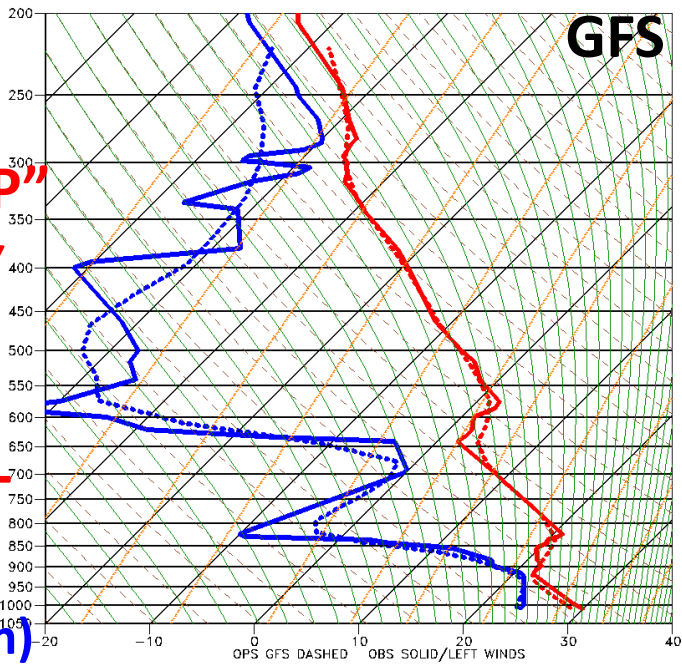
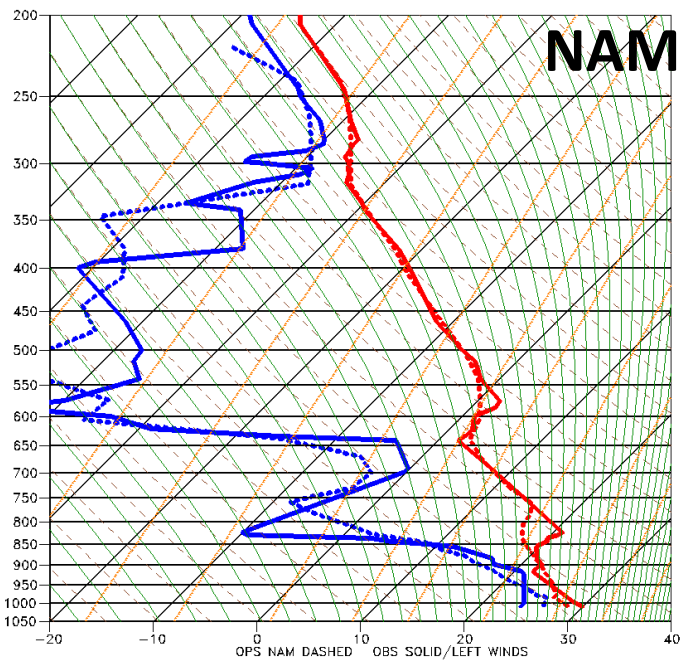
NAM ISSUE WITH "ANKLE-DEEP" BOUNDARY LAYERS ALONG GULF COAST

GFS

12-hr fcst soundings (dash) for

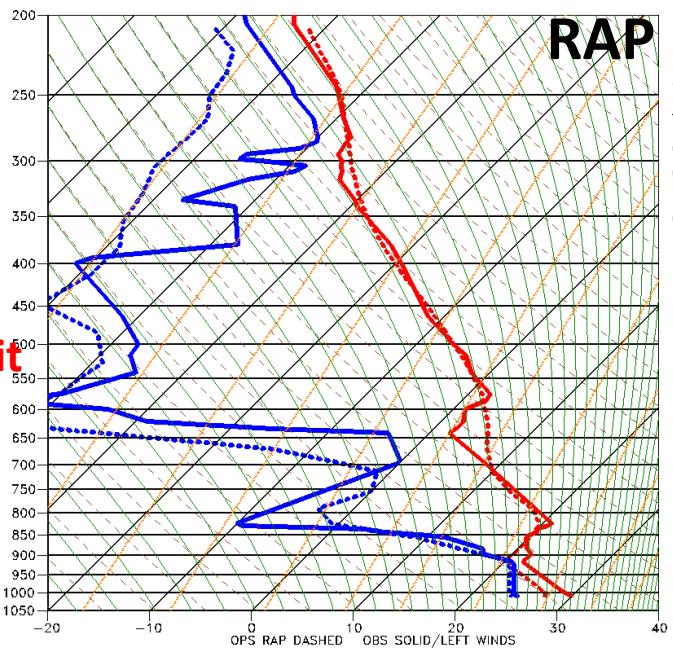
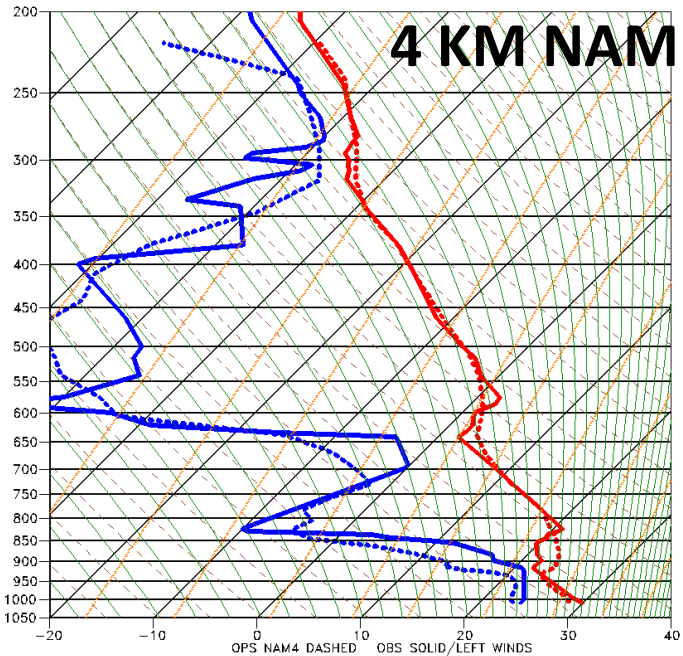
Brownsville, TX vs. obs (solid)

Not as much of an issue in the nest (explicit convection), so parent NAM Convection tests underway

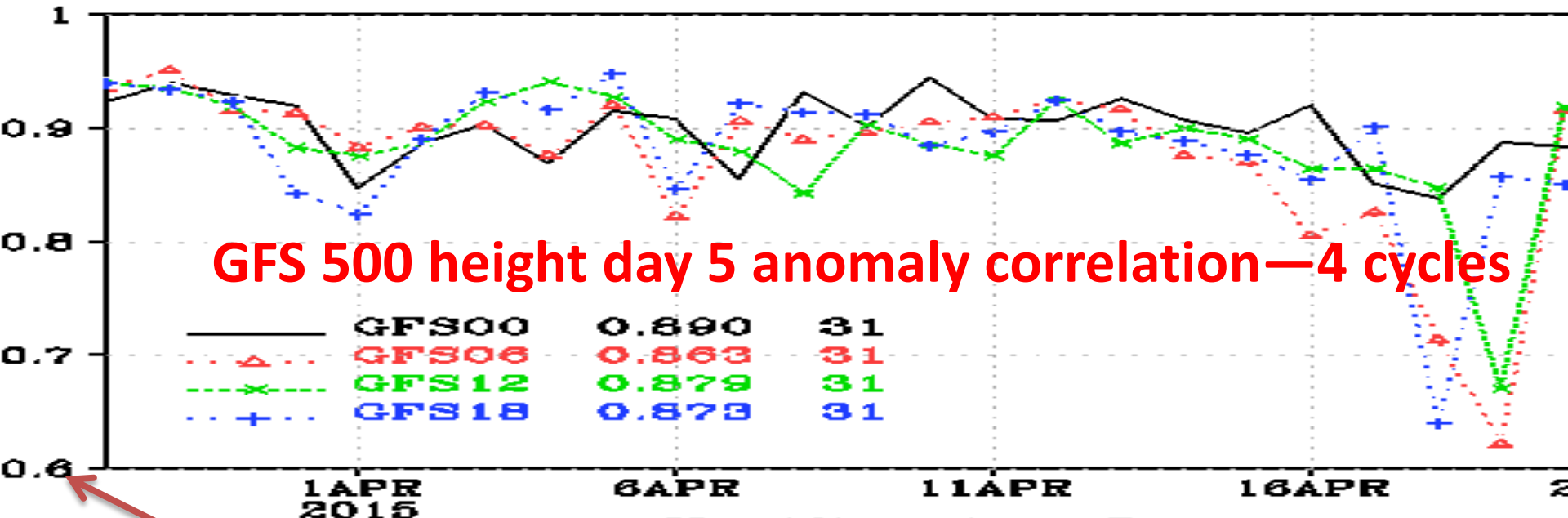


4 KM NAM

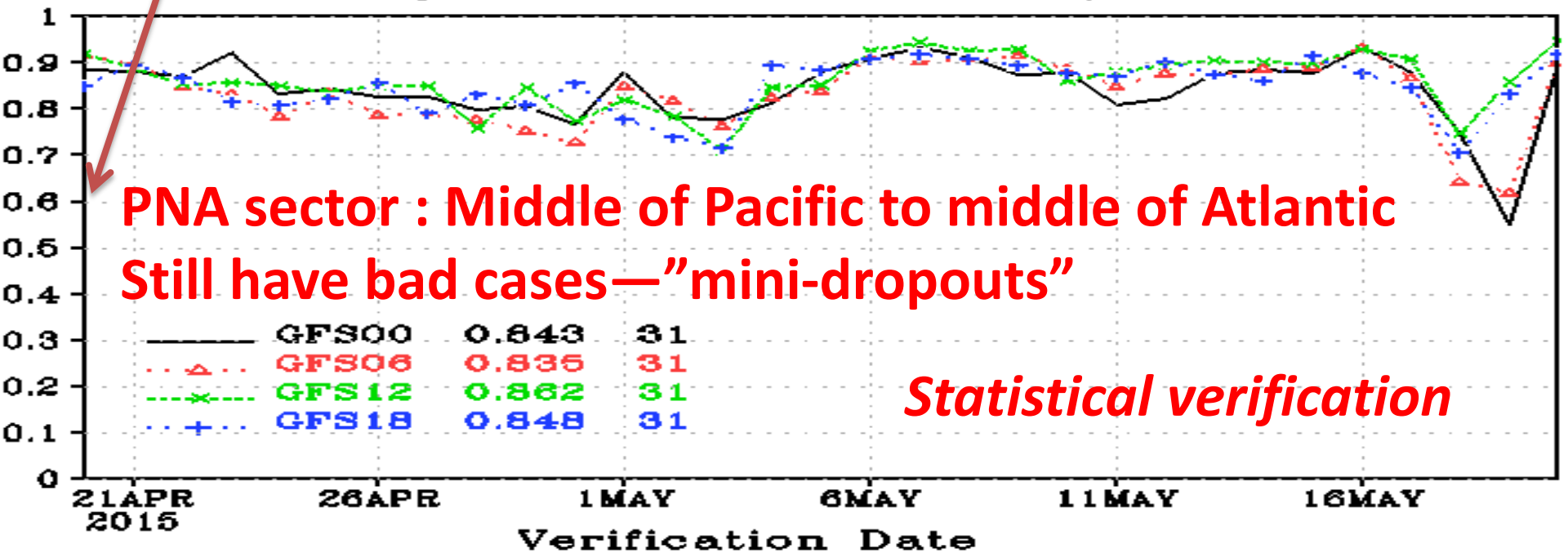
RAP



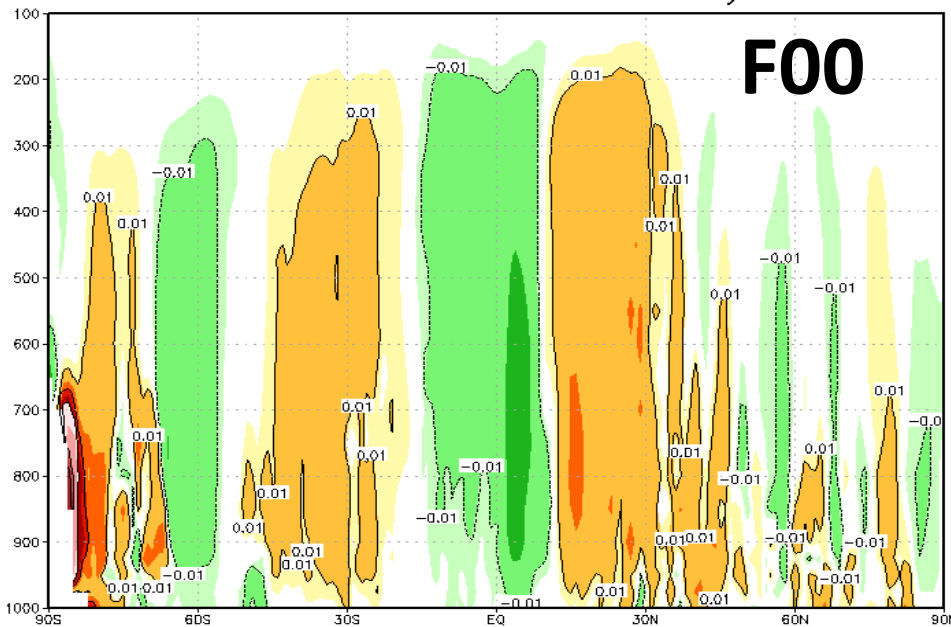
Anomaly Correl: HGT P500 G2/PNA



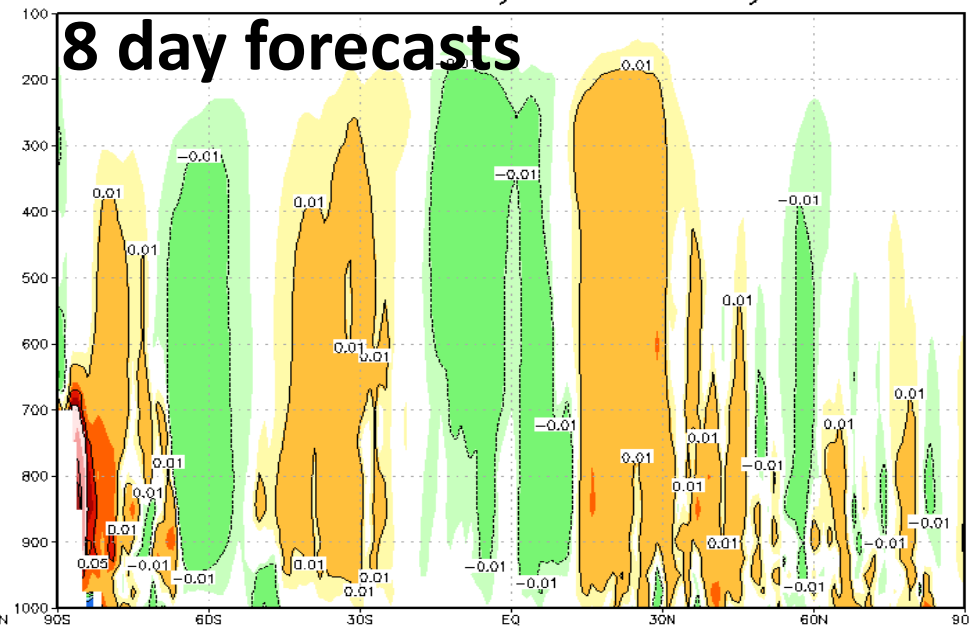
Anomaly Correl: HGT P500 G2/PNA, fh120



zonal mean vvel anl GFS Jan24May1315

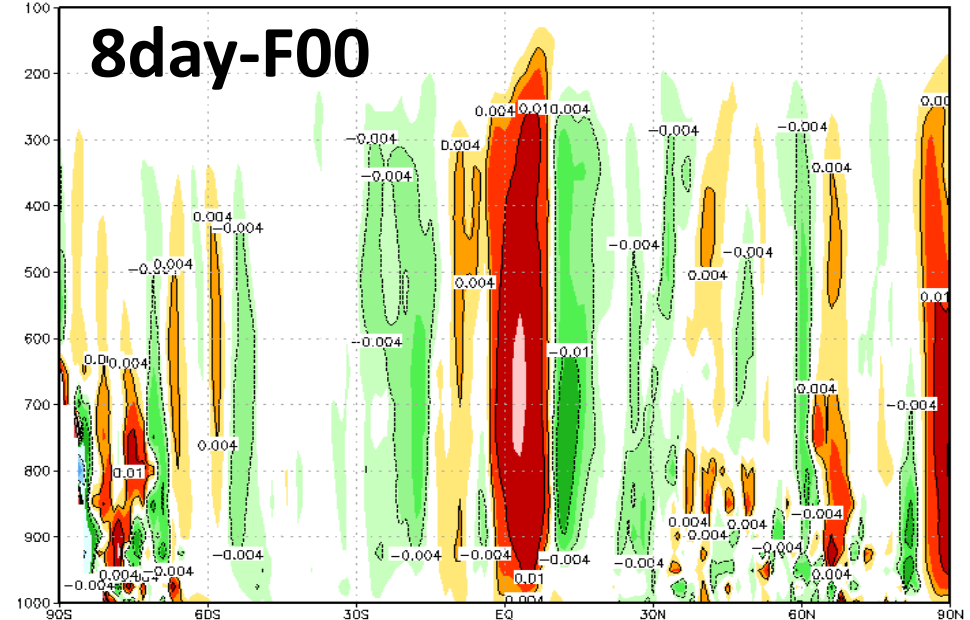


zonal mean vvel 8dy GFS Jan24May1315



**Zonal mean
vertical velocity
F00 vs F168
0Z Jan-May 2015
Time means**

zonal mean vvel 8dy error GFS Jan24May1315



MEG needs to expand

- more complete evaluation of operational and new versions of models
- beyond CONUS
- observations, data assimilation
 - plans for revival of “drop out” team
- more interaction with users
- full, open and user-friendly access to statistics

EMC wants to change implementation process

***--involve rest of NWS in evaluating tests
of improvements to operational models
much earlier and much longer in
implementation process***

***--visitors' program between EMC and
rest of NWS***

MEG meetings Thursday 11:30 AM

Webinars thanks to Southern Region

Everyone welcome

More info or forecast issues:

Glenn.White@noaa.gov

Geoffrey.Manikin@noaa.gov