Overall NWS field products review 8th Ensemble Workshop, Aug 28, 2019

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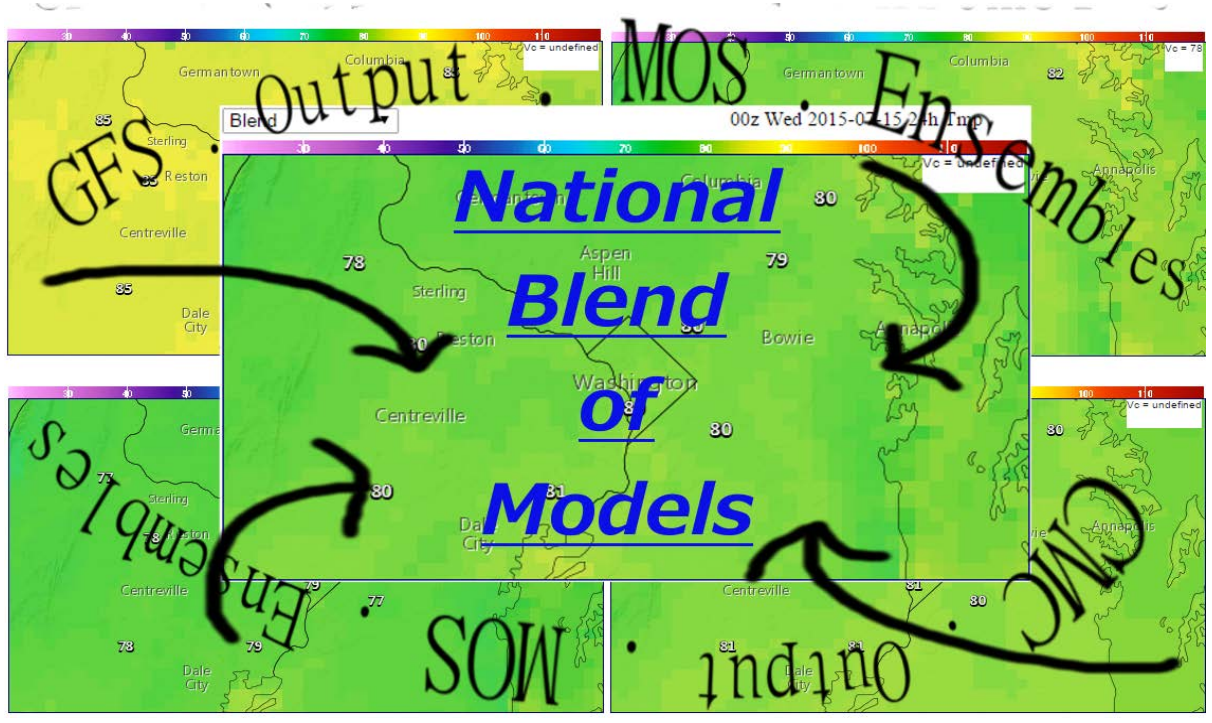
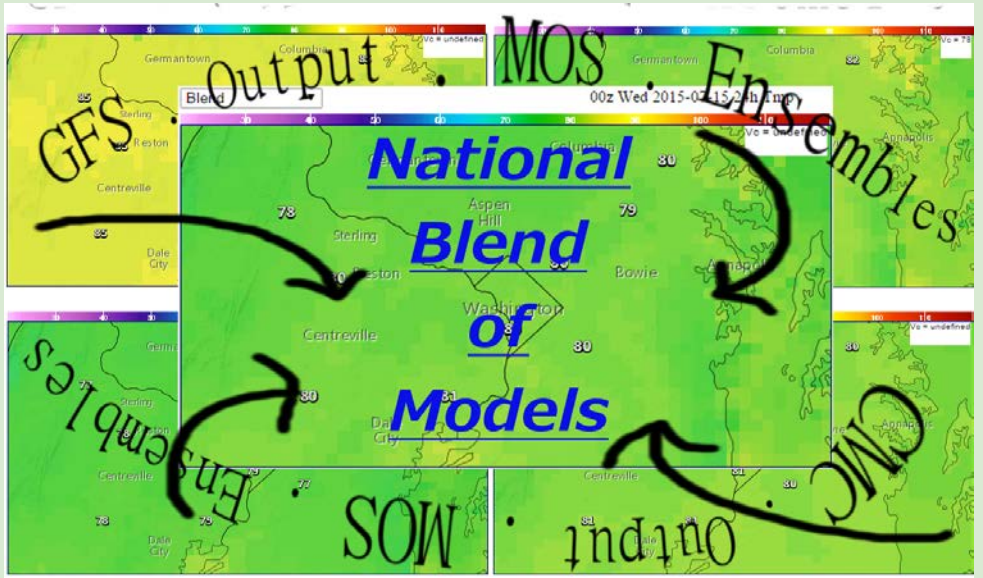
NOAA/NWS/OSTI/MDL Silver Spring, MD



Outline

1. National Blend of Models (NBM) - MME
2. Ensembles used in NBM
3. Probability/Uncertainty products in NBM v3.2 (Nov 2019)
4. Outlook for NBM v4.0 (Oct 2020)



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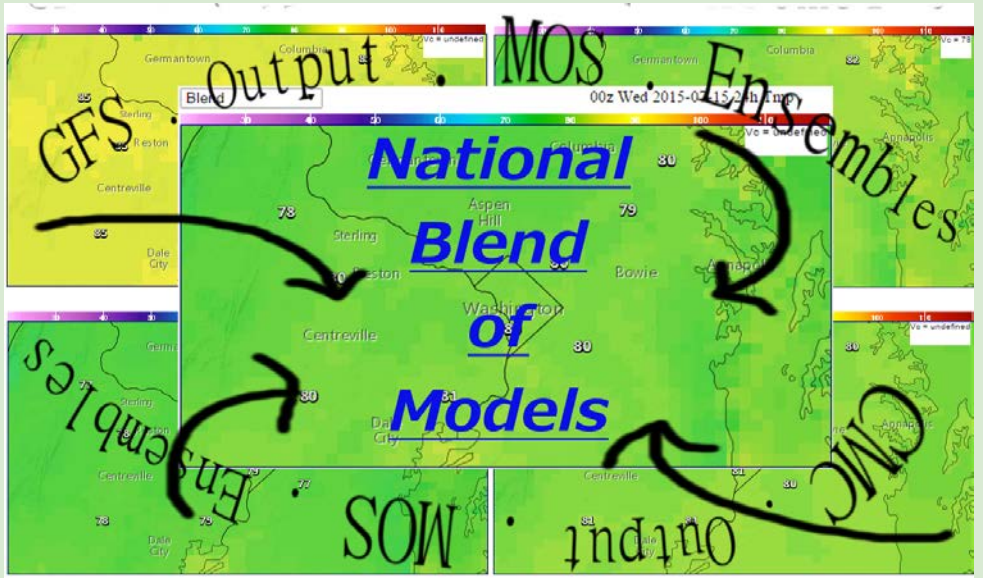

NBM: a path for ensembles to WFOs

1. Unable to send all ensemble information via AWIPS to WFOs
2. Centralized incorporation of all available ensemble data including non-NOAA sources
3. Eventually hope for remote visualization and interrogation of all members (cloud?)

6 NBM sectors

1. CONUS - 2.5 km
2. Alaska - 3 km
3. Hawaii - 2.5 km
4. Puerto Rico - 1.25 km
5. Guam - 2.5 km (new in v3.2)
6. Oceanic - 10 km

Down the line, plans for American Samoa, West Micronesia, and East Micronesia

31 Inputs from 5 NWP centers

1. NCEP 19
2. Canada 4
3. Navy FNMOC 4
4. ECMWF 2

5. BoM Australia 2 (new in v3.2)

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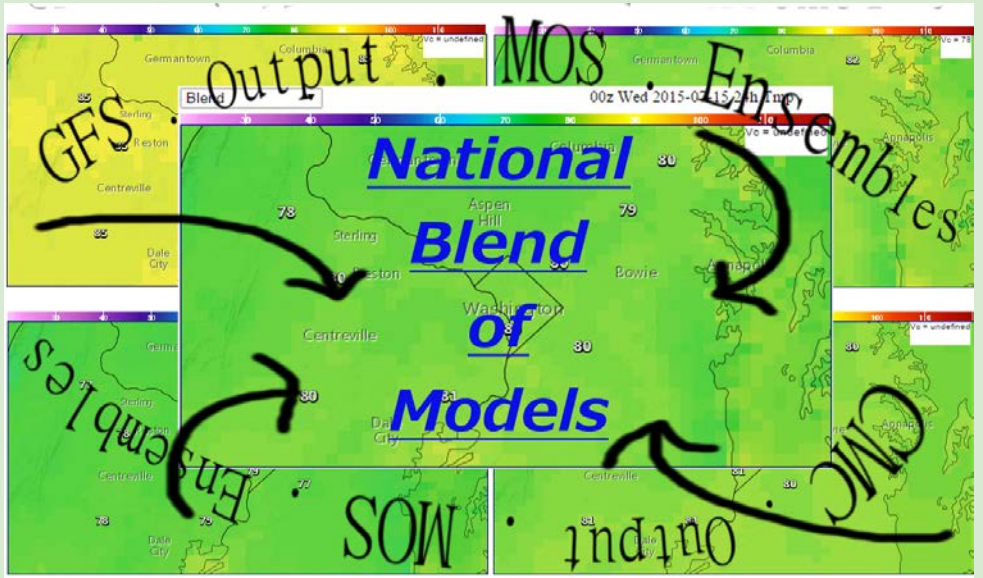


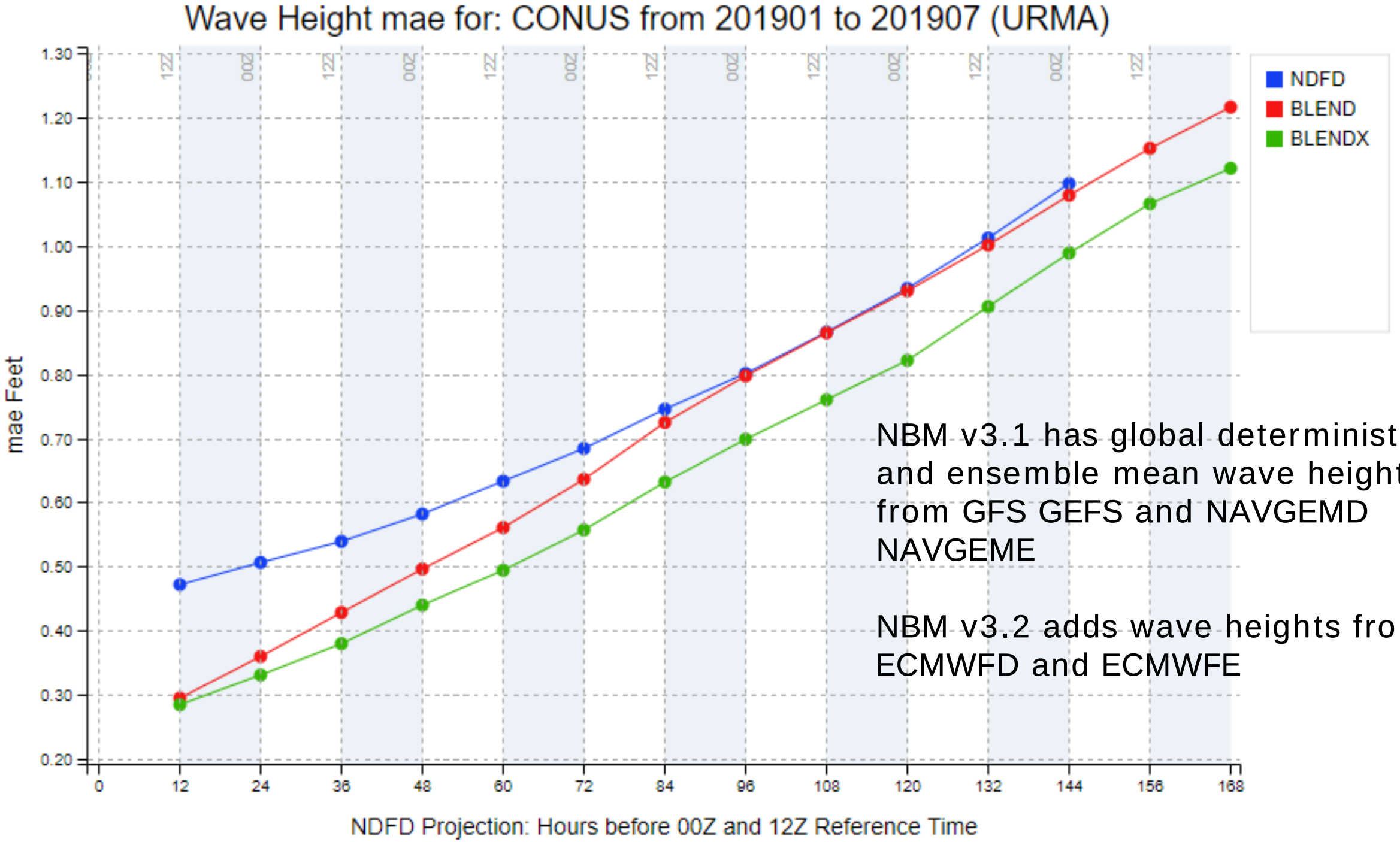
Ensembles in NBM

1. NCEP - HREF, SREF, GEFS
2. Canada - REPS, GEPS
3. Navy FNMOC - NAVGEME
4. ECWMF - ECMWFE

171 total members including ensembles and deterministic inputs for PoP and QPF

NBM v3.2 QMD PoP QPF Ensemble membership #/%

	6-36	42 to 54	60 to 78	84+	#		6-36	42 to 54	60 to 78	84+	%
GFS	1	1	1	1		GFS	1%	1%	1%	1%	
GEFS	20	20	20	20		GEFS	12%	13%	14%	17%	
GDPS	1	1	1	1		GDPS	1%	1%	1%	1%	
GEPS	20	20	20	20		GEPS	12%	13%	14%	17%	
NAVGEMD	1	1	1	1		NAVGEMD	1%	1%	1%	1%	
NAVGEME	20	20	20	20		NAVGEME	12%	13%	14%	17%	
ECMWFD	1	1	1	1		ECMWFD	1%	1%	1%	1%	
ECMWFE	**50**	**50**	**50**	**50**		ECMWFE	**29%**	**31%**	**36%**	**43%**	
NAMNest	1	1				NAMNest	1%	1%			
SREF	24	24	24			SREF		15%	17%		
RDPS	1	1				RDPS	1%	1%			
REPS	20	20				REPS	12%	13%			
HRRR	1				new	HRRR	1%				
RAP	1				new	RAP	1%				
HREF	8				new	HREF	5%				
ACCESS-G	1	1	1	1	new	ACCESS-G	1%	1%			
	171	**160**	**138**	**115**				100%	100%	100%	


Wave Height mae for: CONUS from 201901 to 201907 (URMA)
mae Feet
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0
12
24
36
48
60
72
84
96
108
120
132
144
156
168
NDFD Projection: Hours before 00Z and 12Z Reference Time
NDFD
BLEND
BLENDX
NBM v3.1 has global deterministic and ensemble mean wave heights from GFS GEFS and NAVGEMD NAVGEME
NBM v3.2 adds wave heights from ECMWFD and ECMWFE

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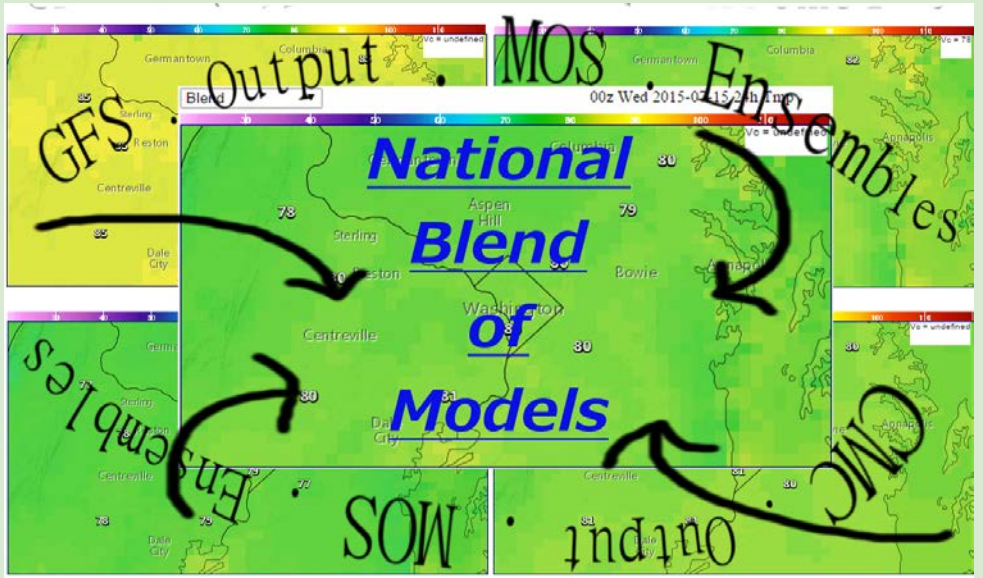


Probability products

1. PQPF06 (CO, AK, PR, OC)
   a. Full Spectrum calibrated CO, AK, PR
   b. 10th 50th 90th uncalibrated OC
2. PQPF24 (CO, AK, PR)
3. PMSL 10th 50th 90th (OC)
4. Wind Speed 10th 25th 50th 75th 90th (OC)
5. Snow06 Ice06 5th 10th 25th 50th 75th 90th 95th (CO, AK)
6. Snow24 Ice24 5th 10th 25th 50th 75th 90th 95th (CO, AK)
7. Snow48 and Snow72 Probs (CO, AK)

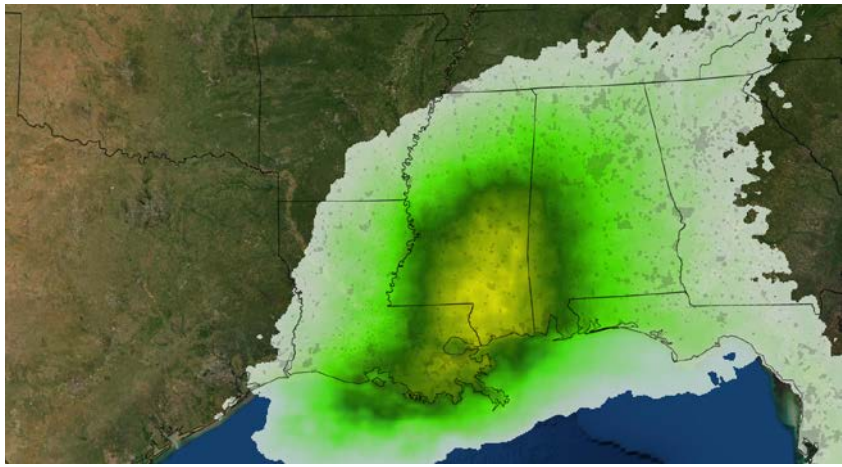
Also various threshold exceedance probabilities for snow/ice

Barry July 10 2019 00z 132 hour PQPF24

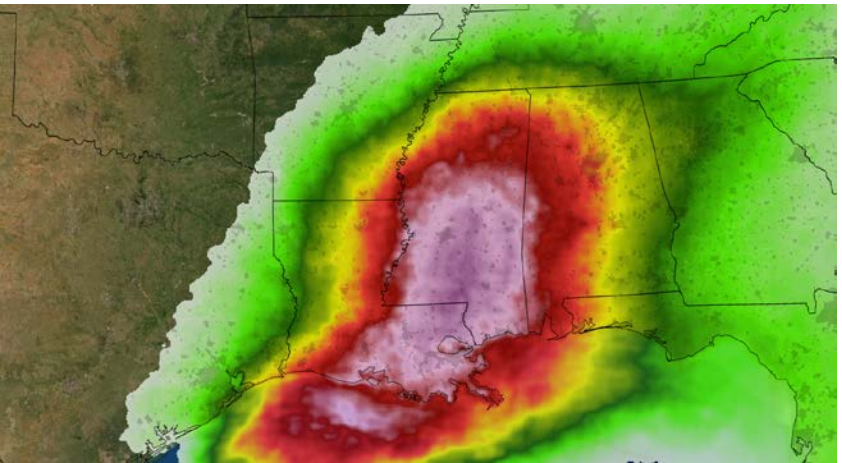
10th percentile

25th percentile

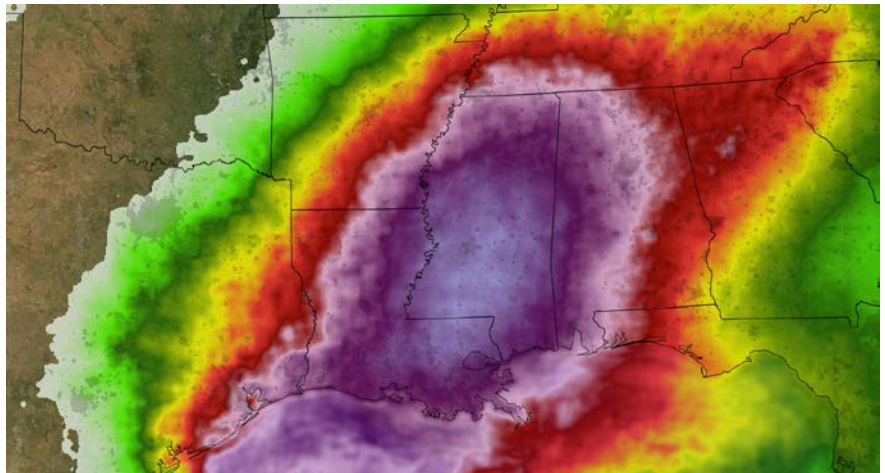
50th percentile



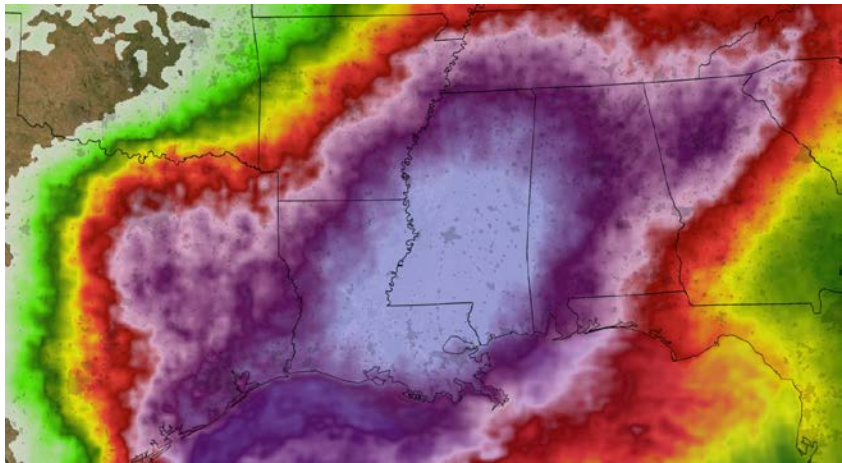
75th percentile



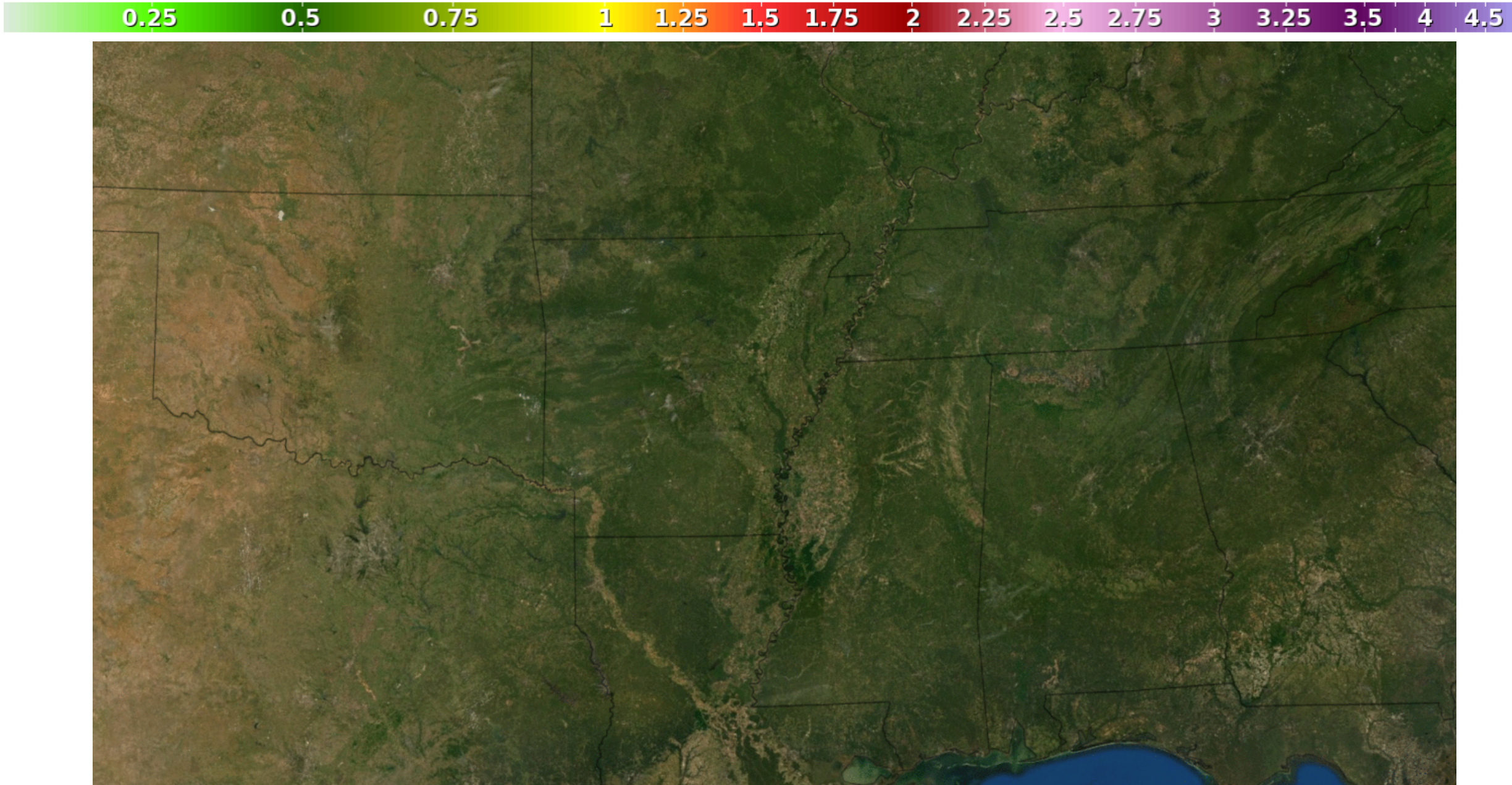
90th percentile

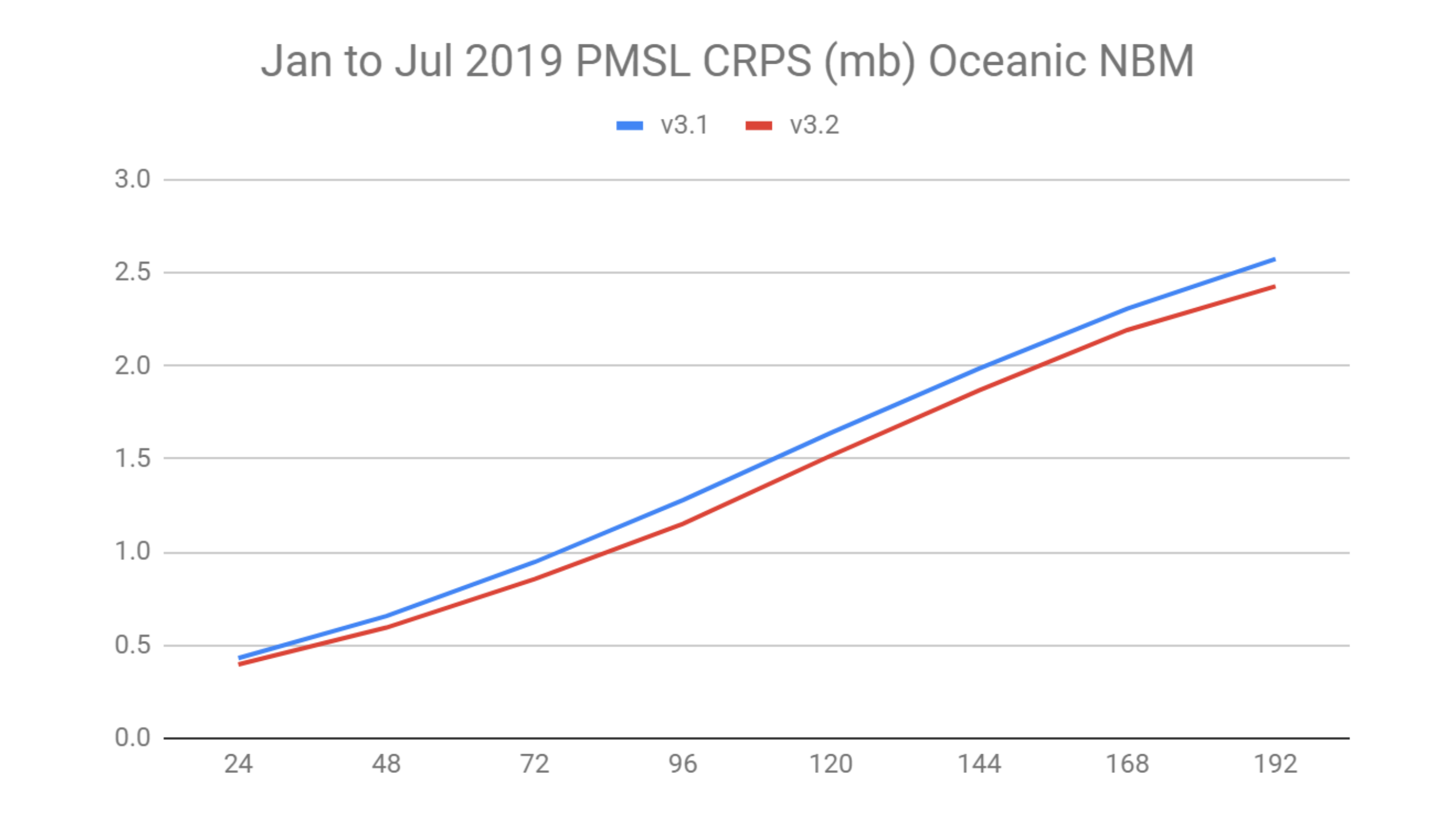


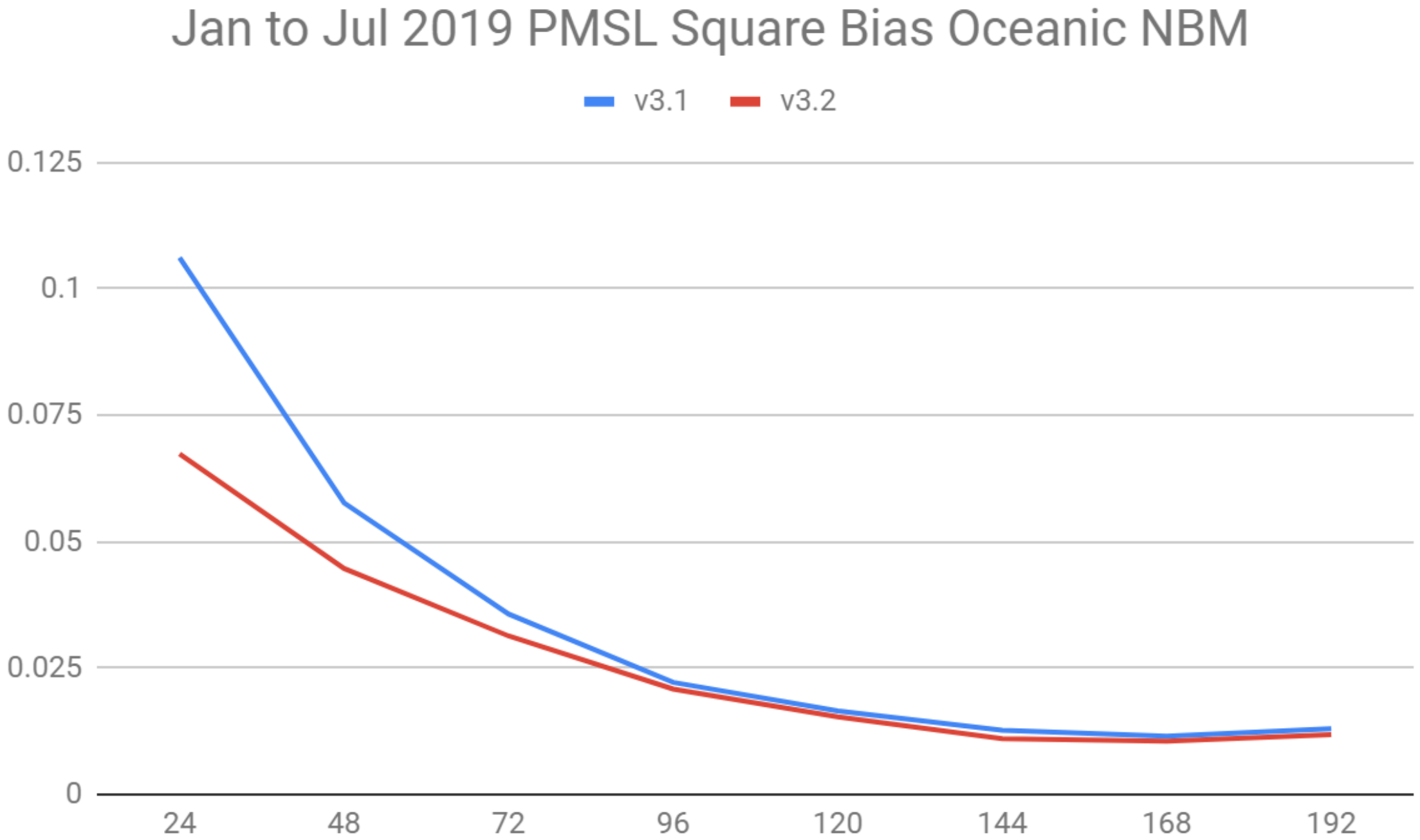
95th percentile



Barry July 11 2019 00z v3.2 132 hour PQPF24

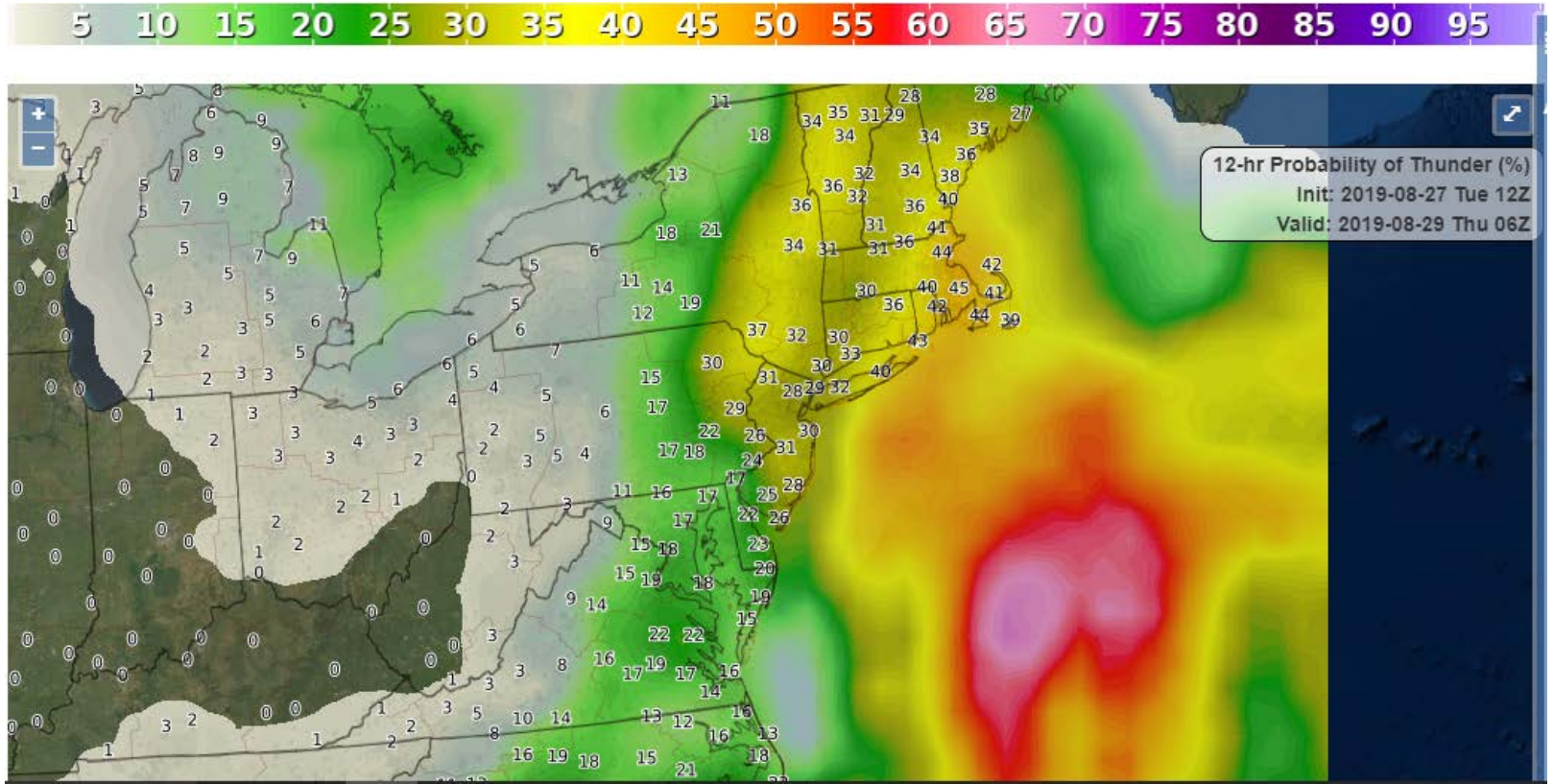



Jan to Jul 2019 PMSL CRPS (mb) Oceanic NBM
v3.1
v3.2
3.0
2.5
2.0
1.5
1.0
0.5
0.0
24
48
72
96
120
144
168
192


Jan to Jul 2019 PMSL Square Bias Oceanic NBM
v3.1
v3.2
0.125
0.1
0.075
0.05
0.025
0
24
48
72
96
120
144
168
192

Probability products

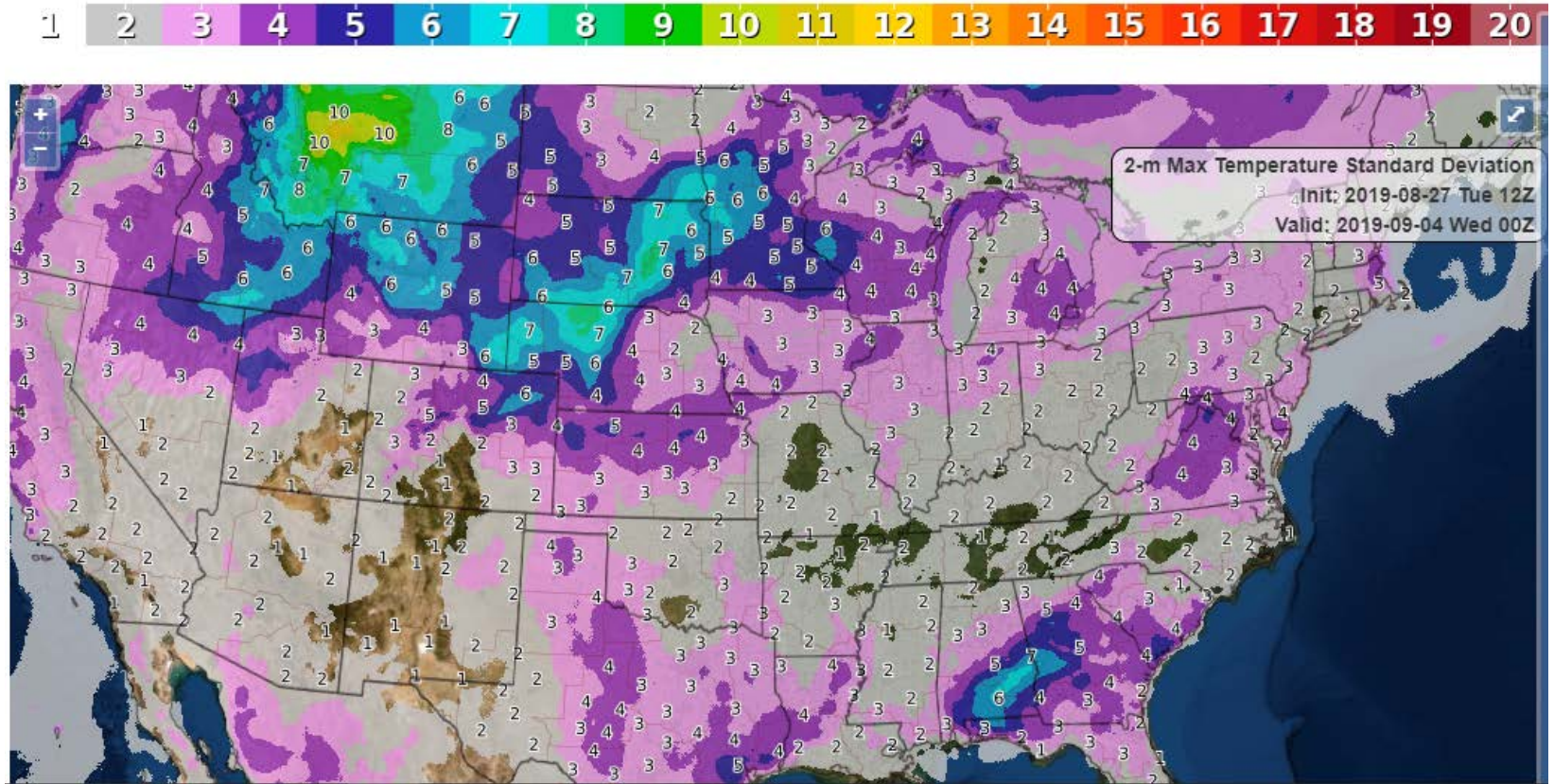
1. 1 hour Probability of Thunder (CO)
2. 3 hour Probability of Thunder (CO, OC)
3. 12 hour Probability of Thunder (CO, OC)



LAMP
HRRR
SREF
NAM MOS
GFS MOS
ECMWFD MOS

Uncertainty products

1. MaxT Standard Deviation (CO,AK,HI,PR)
2. MinT Standard Deviation (CO,AK,HI,PR)
3. Wind Speed Standard Deviation (CO,AK,HI,PR,GU)
4. Wind Gust Standard Deviation (CO,AK,HI,PR,GU)



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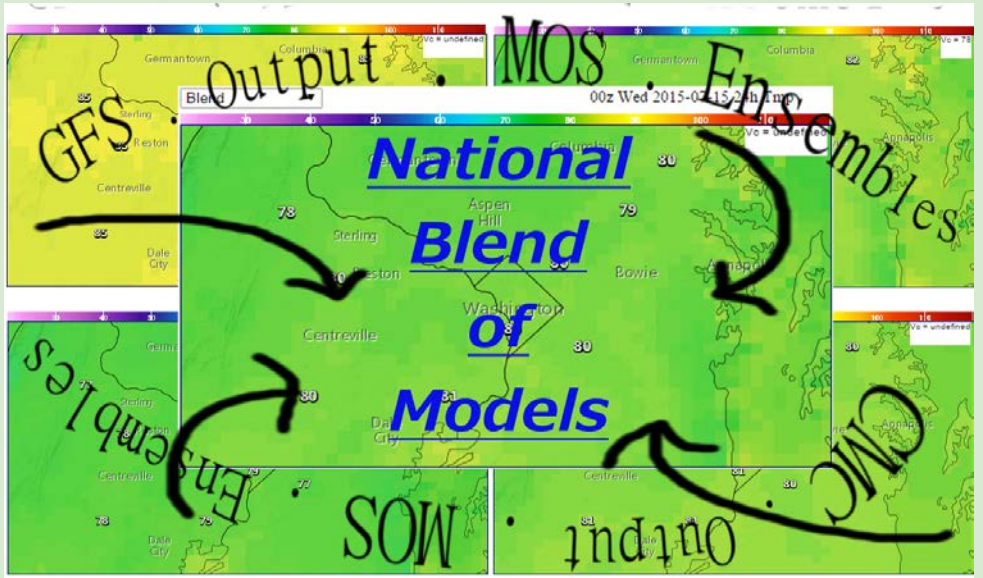

NBM v4.0 probability products

1. Prob MaxT MinT (CO)
2. Prob 6 hour Thunder (CO)
3. Prob Visibility (CO, AK, HI, PR, OC)
4. Prob Ceiling (CO, AK, HI, PR)
5. Prob Snow Level (CO, AK)
6. Prob wind speed (CO, AK, HI, PR)
7. Prob wind gust (CO, AK, HI, PR)
8. Prob MaxRH MinRH (CO)
9. Prob Tornado, Hail, Wind Day 1 (CO via SPC)

Thanks for your kind attention

https://www.weather.gov/mdl/nbm_home

https://blend.mdl.nws.noaa.gov

https://vlab.ncep.noaa.gov/group/national-blend-of-models

https://veritas.nws.noaa.gov/qpfvs/

NBM v3.2 Master Documentation