

Baton Rouge 2010 WRF Application and Evaluation

Dennis McNally

Alpine Geophysics, LLC

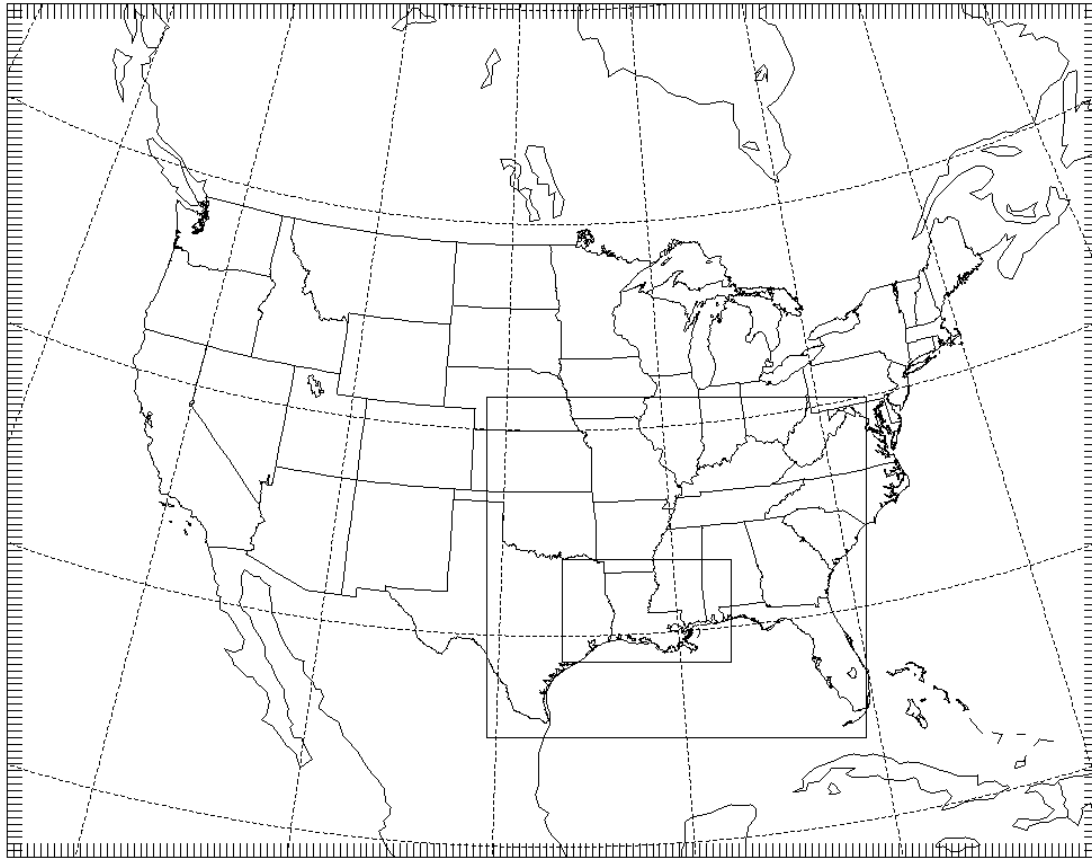
Arvada, Colorado

November 14, 2012

Contents

- Model Configuration
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Modeling Domains



“RPO” LCP Projection

36km : CONUS

12km : Southeastern US

4km: Western Gulf Coast

Modeling Period

- 28 July 2010 through 4 November 2010
 - Model Initialized Every 5 days at 12Z
 - 12 hour spinup

Physics Options

- Long/Short Wave Radiation: RRTMG
- Mixed Phase Water: WSM-3
- Land Surface Model: NOAH
- PBL Scheme: YSU
- Cumulus Parameterization: Grell
- Initialization Dataset: 12km NAM

Vertical Structure

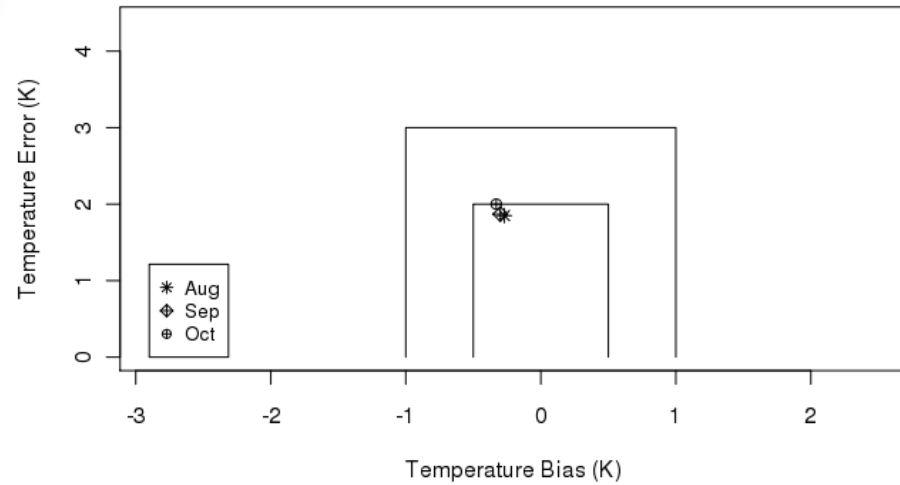
Level	Eta	Height	dZ	Level	Eta	Height	dZ
1	1	0.0		19	0.8	1742.2	373.1
2	0.9985	12.0	12.0	20	0.76	2129.7	387.6
3	0.997	24.1	12.0	21	0.72	2533.1	403.3
4	0.995	40.1	16.1	22	0.68	2953.7	420.6
5	0.993	56.2	16.1	23	0.64	3393.4	439.6
6	0.991	72.4	16.1	24	0.6	3854.1	460.7
7	0.988	96.6	24.2	25	0.55	4463.3	609.2
8	0.985	120.9	24.3	26	0.5	5114.9	651.6
9	0.98	161.5	40.6	27	0.45	5816.1	701.2
10	0.97	243.2	81.7	28	0.4	6576.3	760.2
11	0.96	325.6	82.4	29	0.35	7407.9	831.6
12	0.95	408.6	83.0	30	0.3	8327.8	919.9
13	0.94	492.3	83.7	31	0.25	9360.1	1032.3
14	0.93	576.6	84.4	32	0.2	10541.2	1181.1
15	0.91	747.5	170.9	33	0.15	11929.7	1388.5
16	0.89	921.2	173.8	34	0.1	13630.3	1700.6
17	0.87	1098.0	176.8	35	0.06	15355.1	1724.8
18	0.84	1369.1	271.1	36	0.027	17204.9	1849.7

Model Performance Evaluation

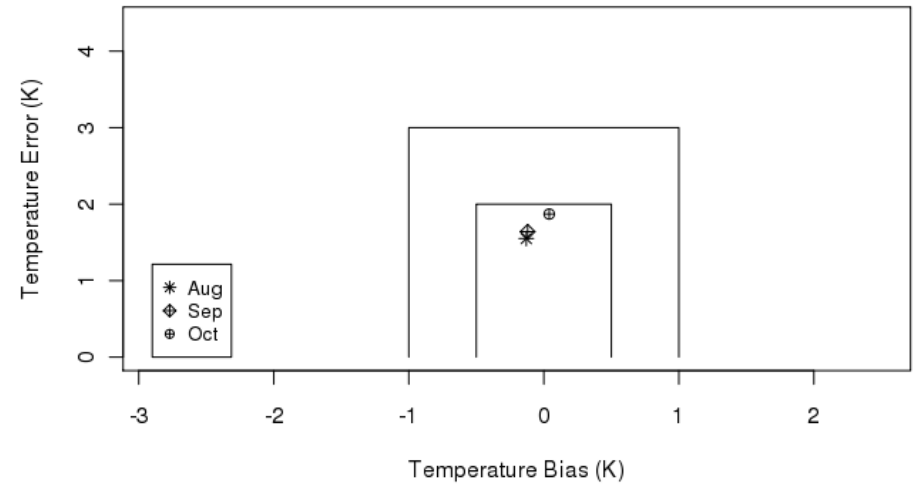
- Temperature
- Humidity
- Wind
- Precipitation

Temperature

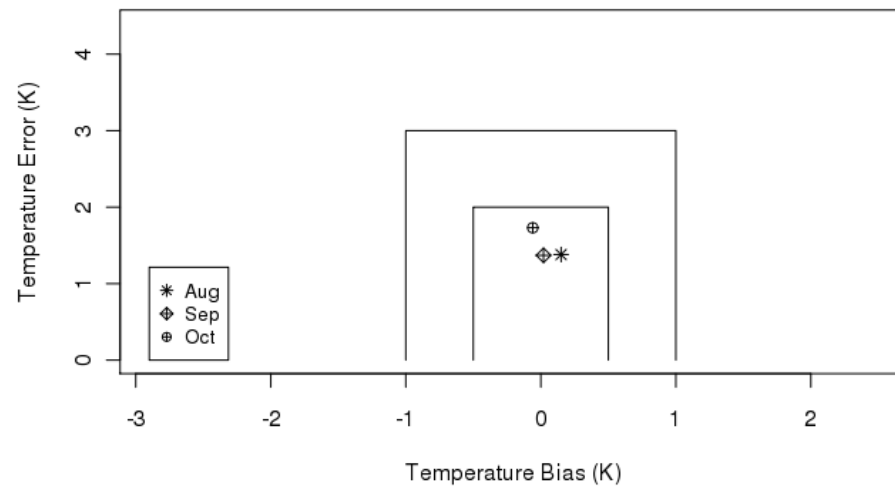
Baton Rouge WRF 36km Temperature Performance Comparison



Baton Rouge WRF 12km Temperature Performance Comparison

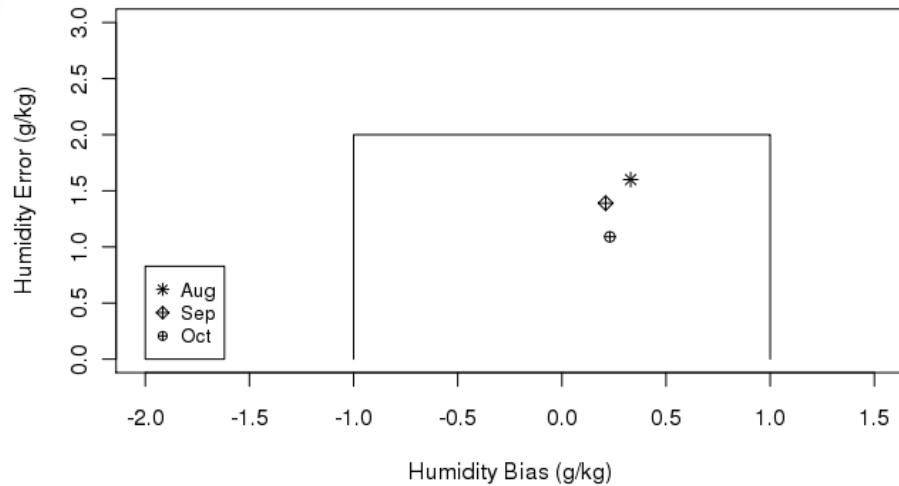


Baton Rouge WRF 04km Temperature Performance Comparison

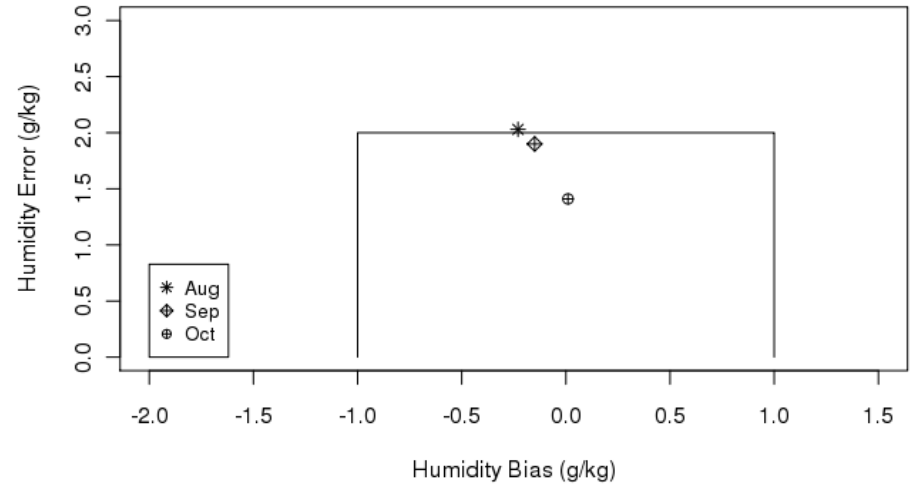


Humidity

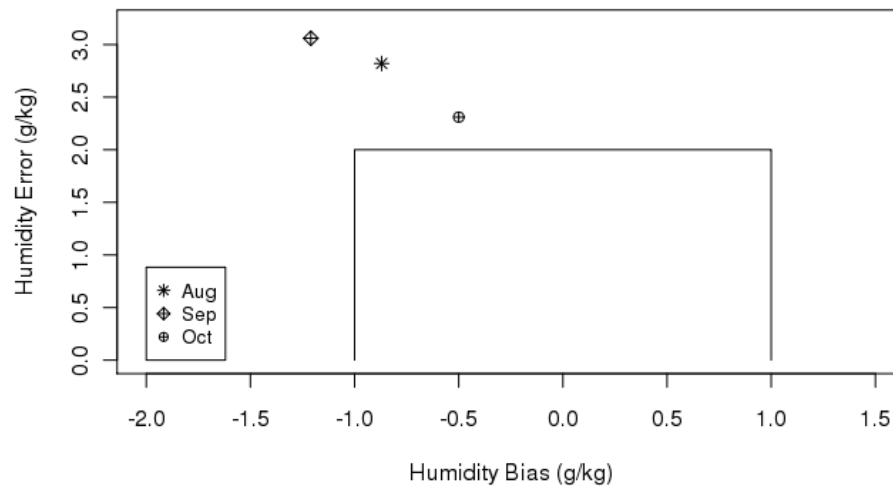
Baton Rouge WRF 36km Humidity Performance Comparison



Baton Rouge WRF 12km Humidity Performance Comparison



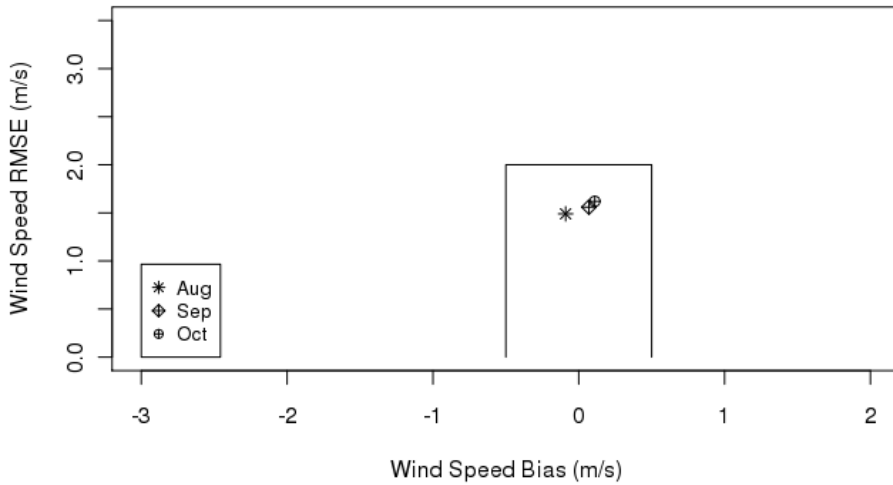
Baton Rouge WRF 04km Humidity Performance Comparison



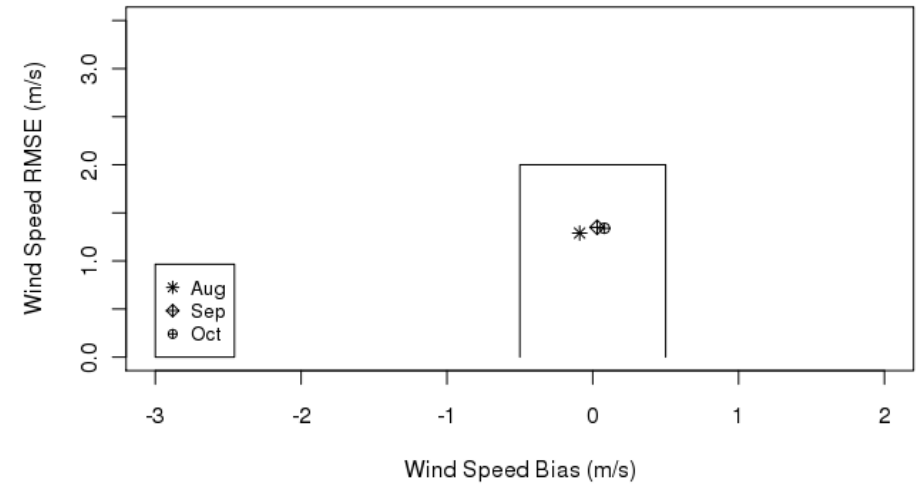
**4km outside guideline
but humid area so
smaller relative error**

Wind Speed

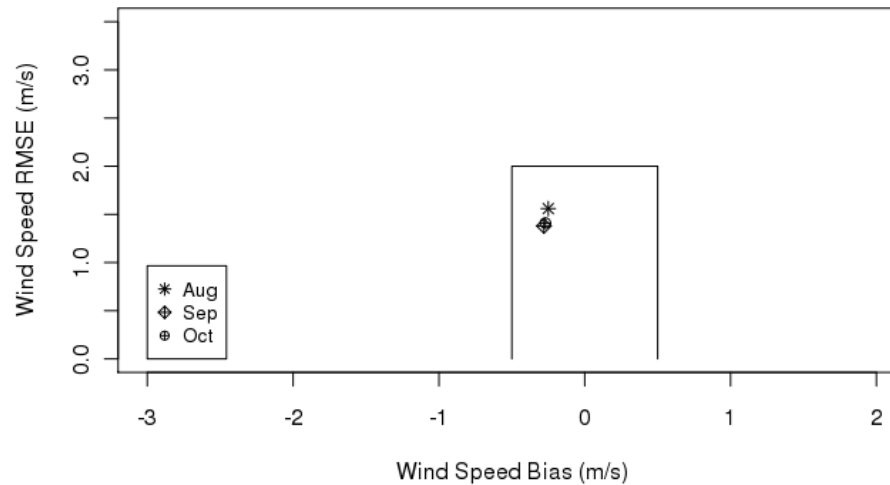
Baton Rouge WRF 36km Wind Speed Performance Comparison



Baton Rouge WRF 12km Wind Speed Performance Comparison

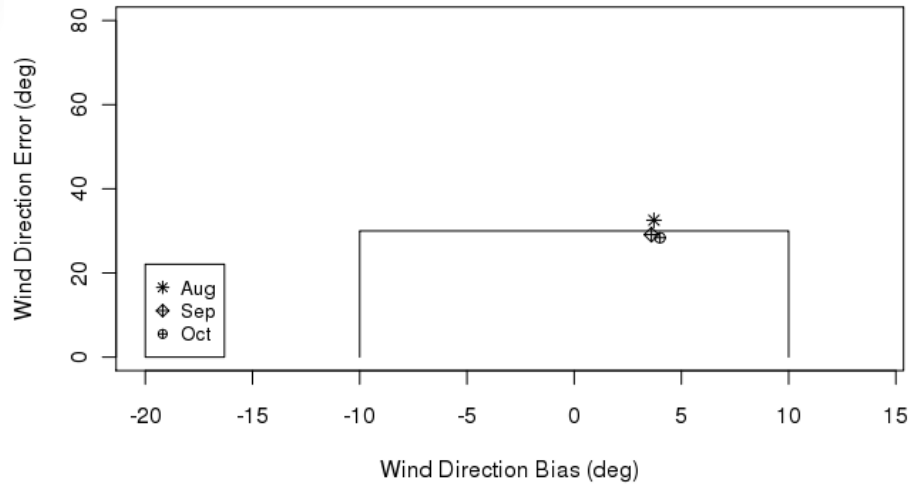


Baton Rouge WRF 04km Wind Speed Performance Comparison

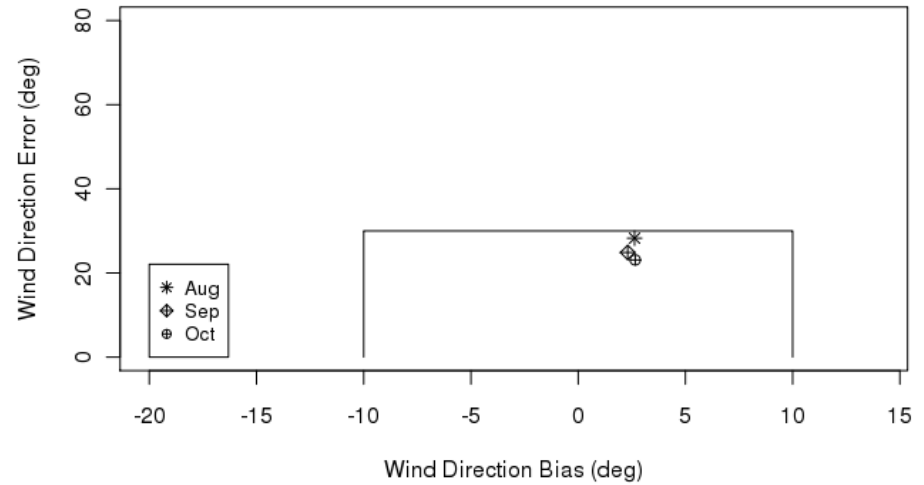


Wind Direction

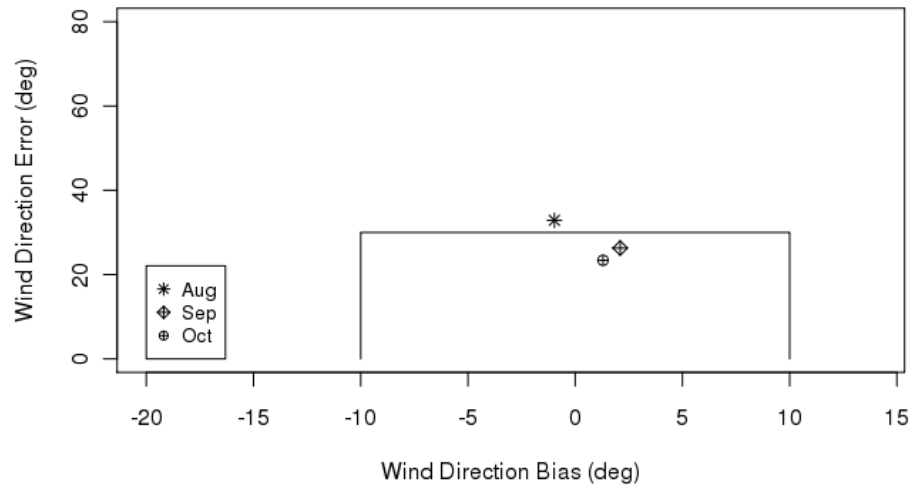
Baton Rouge WRF 36km Wind Direction Performance Comparison



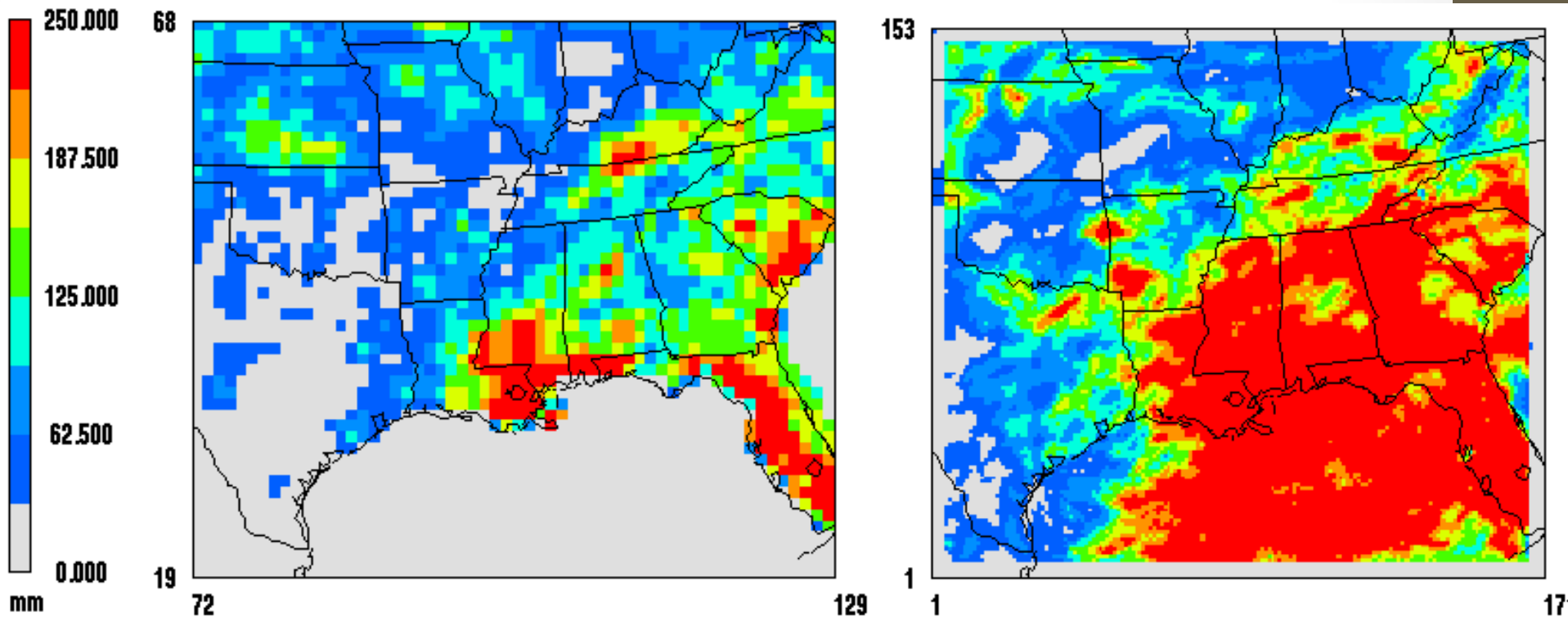
Baton Rouge WRF 12km Wind Direction Performance Comparison



Baton Rouge WRF 04km Wind Direction Performance Comparison

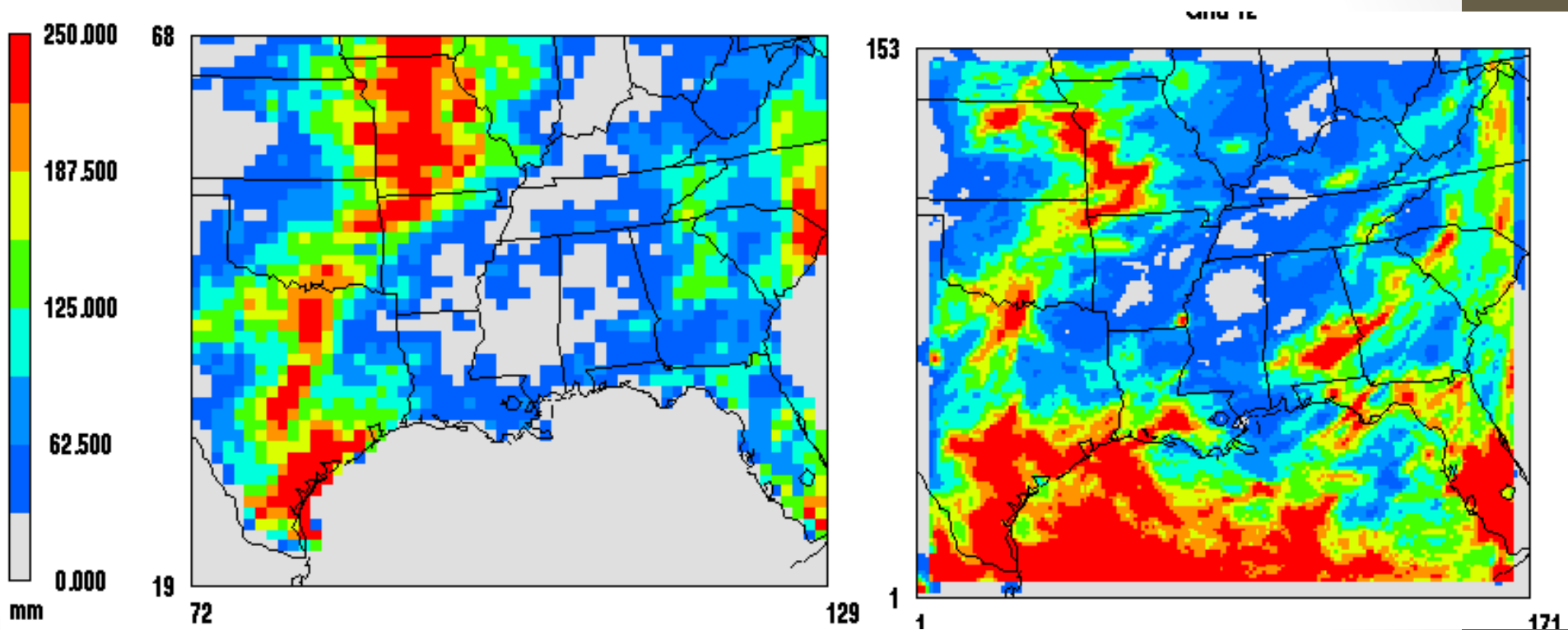


12km Precipitation (August)

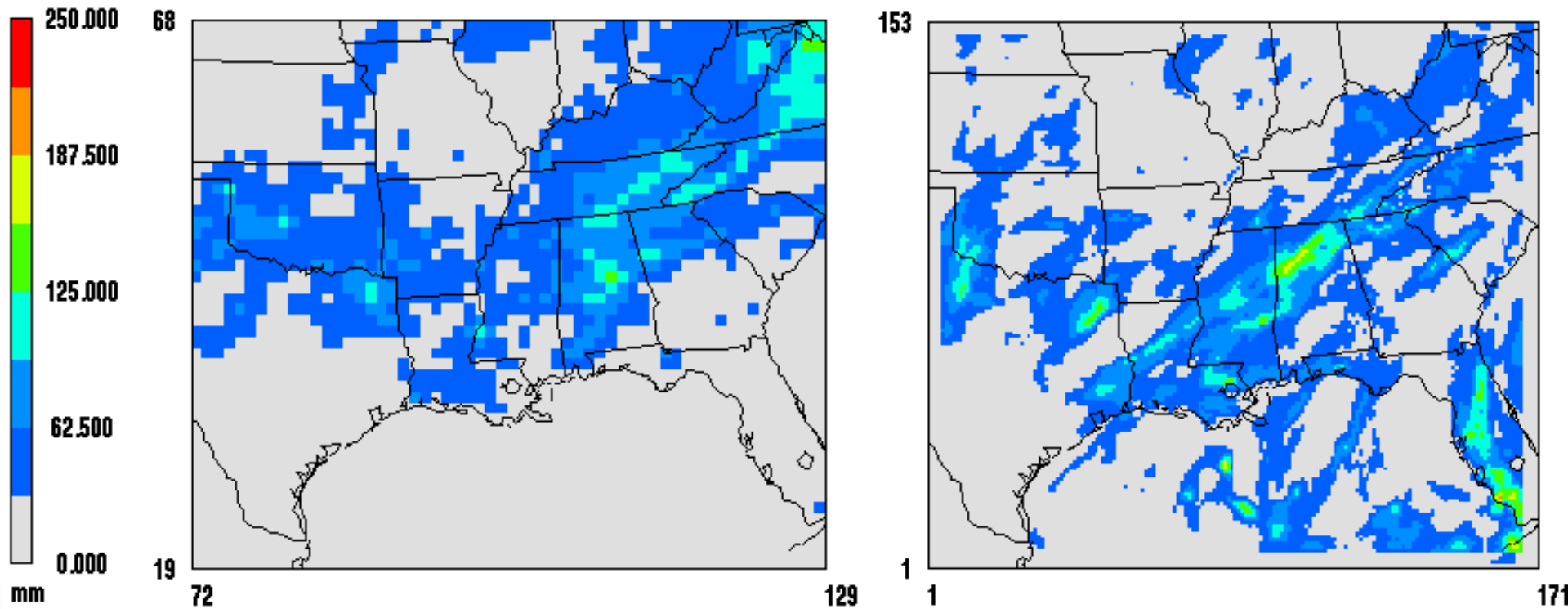


NOTE: CPC analysis does not extend beyond CONUS

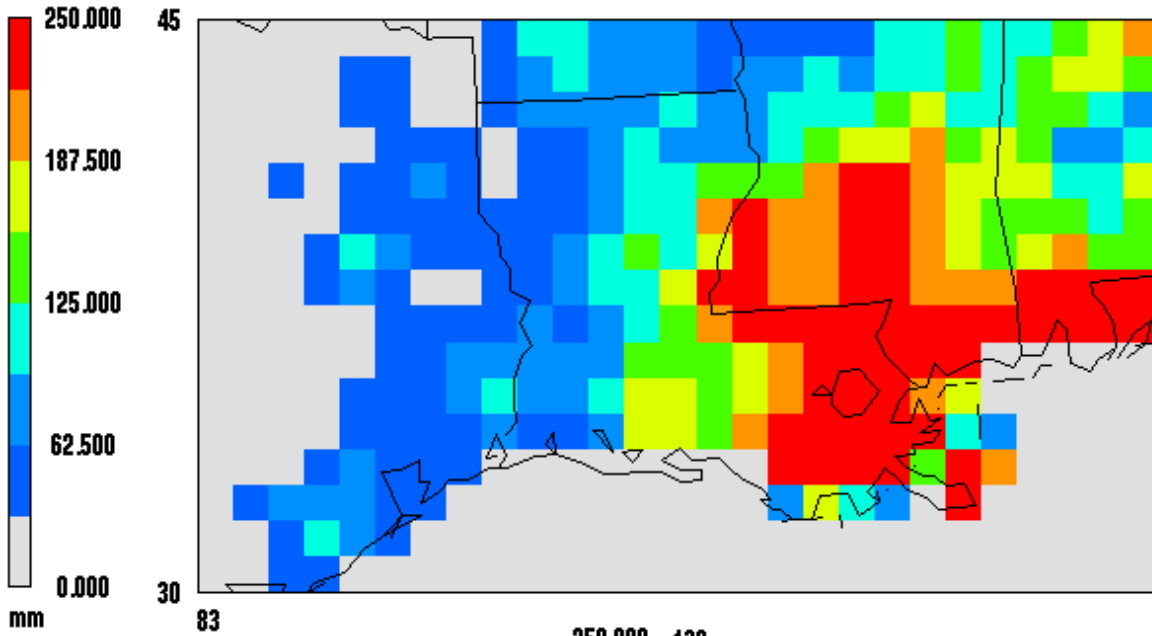
12km Precipitation (Sept.)



12km Precipitation (Oct.)

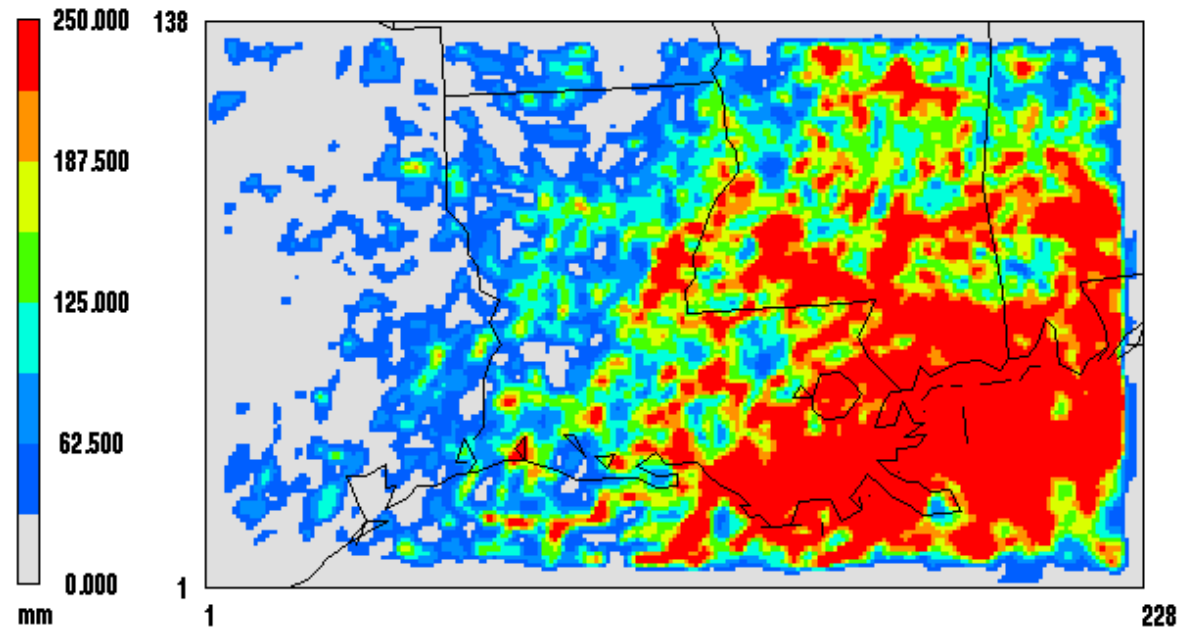


4km Precipitation (August)



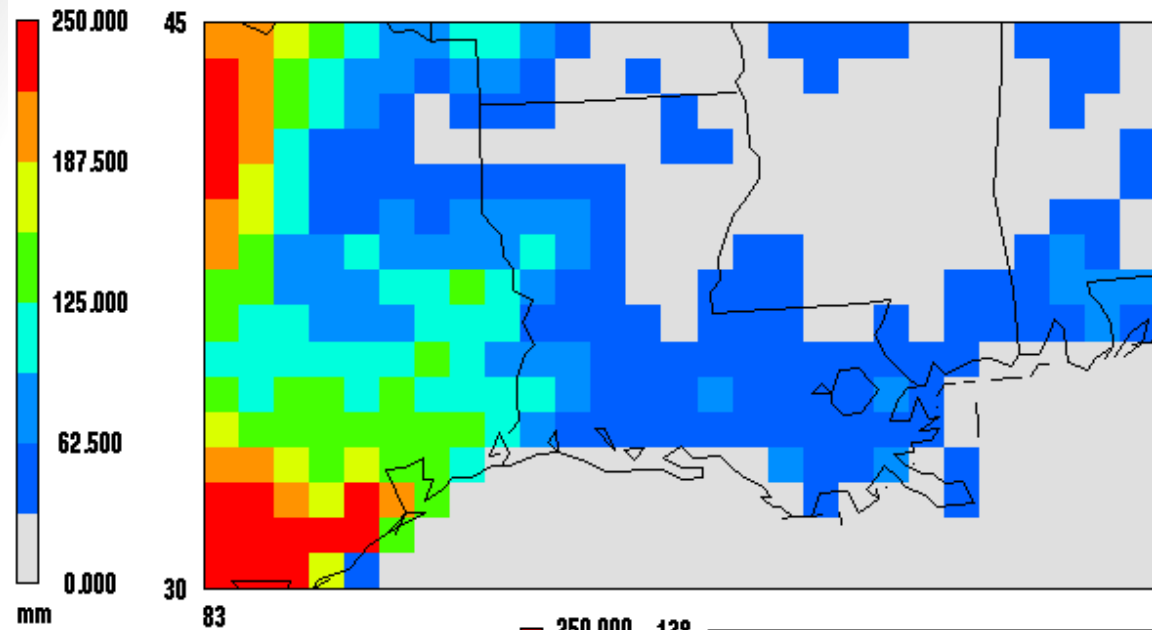
CPC Observation

WRF Model

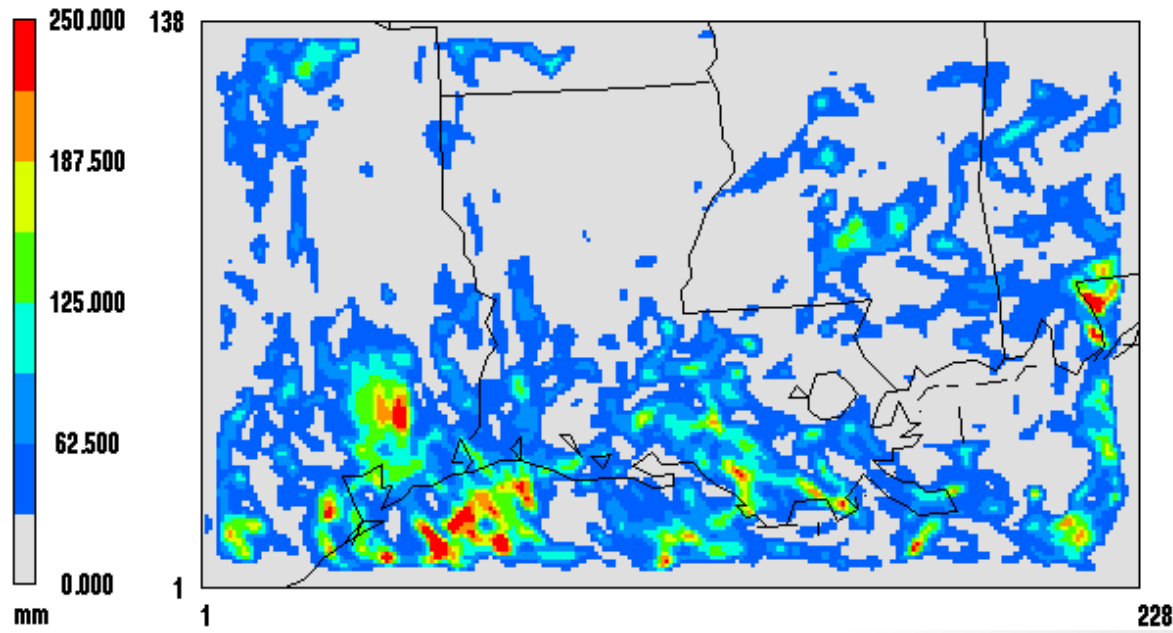


4km Precipitation (Sept.)

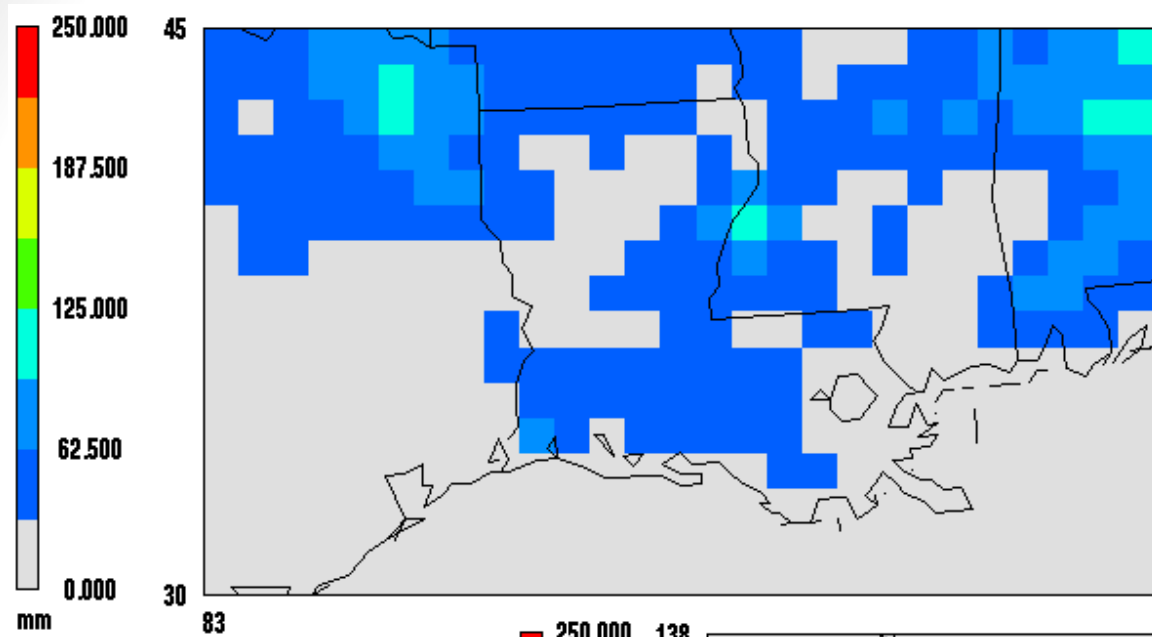
CPC Observation



WRF Model

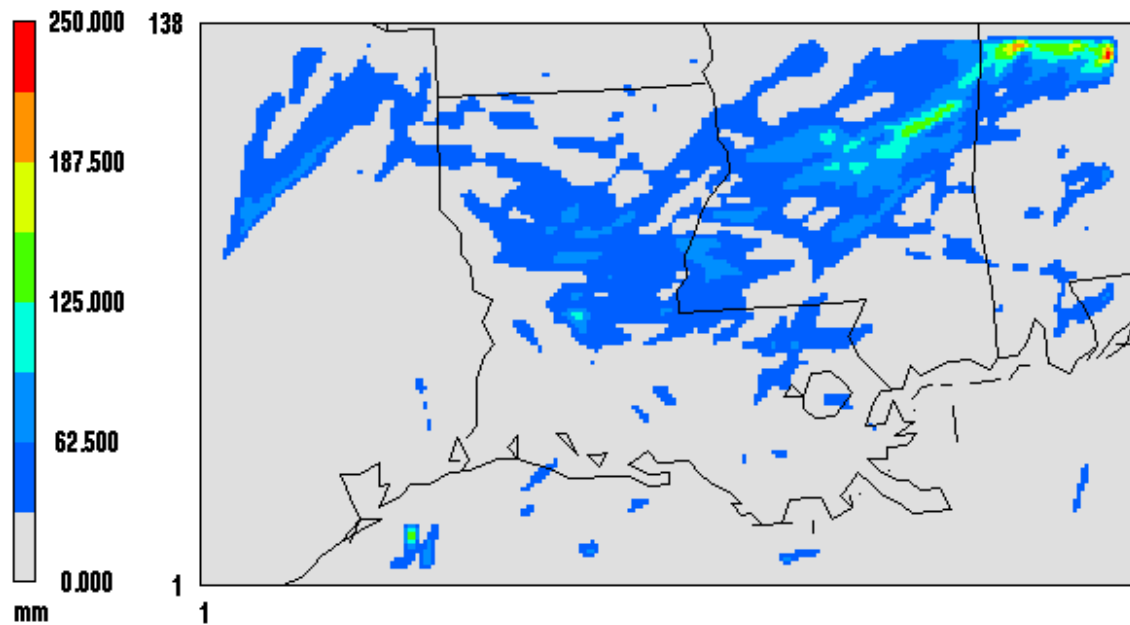


4km Precipitation (Oct.)



CPC Observation

WRF Model



Performance Summary

- Overall Very Pleased with Simulation
 - Temperature within stringent episodic guidelines for all three domains. Very low bias
 - Humidity with guidelines for 36km and 12km somewhat outside for 4km domain, but a summer period in humid area, smaller relative error
 - Wind speed within stringent episodic guidelines for all three domains. Very low bias
 - Wind direction at or very near guideline. Low bias (less than ± 5 degrees)
 - WRF tending to overestimate precip in 12km domain particularly in AL and GA.
 - 4km precip. pretty good, except for underestimating in TX in Sep.