WR QPF/PoP Verification

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RFC Verification Workshop II
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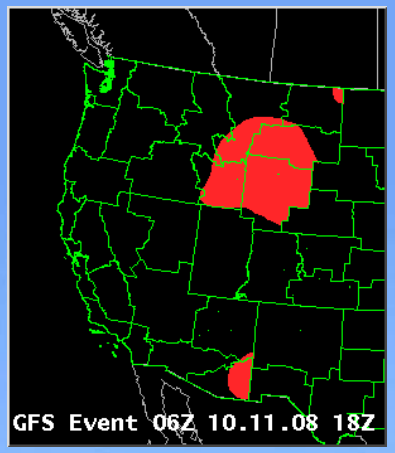
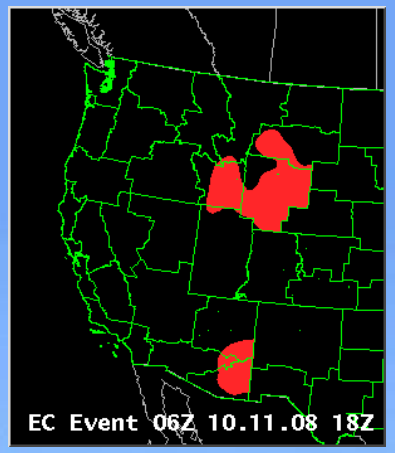
Last season

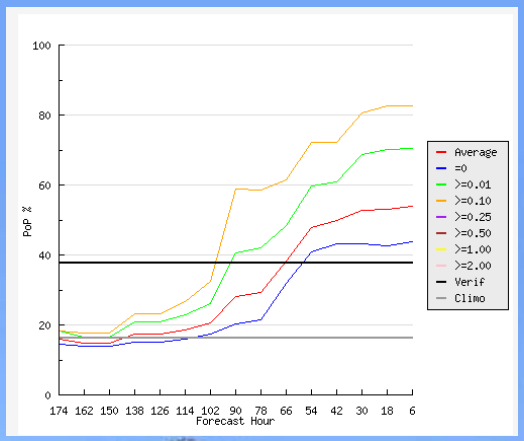
- Had each WFO archive 6-hr QPE analysis and model/forecast QPF grids
- Conducted monthly calls with the SOO's focusing on either
  - Long-term statistics
  - Single events

Last season

- Also tried to make offices aware of their surroundings
- Created an internal AWIPS web page to provide an archive of forecast/model data







Last season

- Encouraged offices to use climatology when forecasting PoPs
  - as a reference point
  - as a starting point at longer lead times

Assessing Results

- Top achievement
  - Got most WFO's thinking about QPF/PoP performance
- Biggest challenge
  - How to use the data in a meaningful way
  - Climate can influence this significantly

Assessing Results

- QPF/PoP not like temperature
- With temperature, we found
  - 90-95% of the time, we can plug in the best model and do as well as we could spending hours trying to make the best forecast
  - Bias correction is a huge help to increasing accuracy while reducing workload
  - Days with big temperature change provide the cases with the biggest model busts

Assessing Results

- QPF/PoP is different from T
  - QPF fields from models are too smooth for the west
  - Models don’t produce PoP fields
  - Some statistical output for PoP (MOSGuide, SREF), but again the output is too smooth

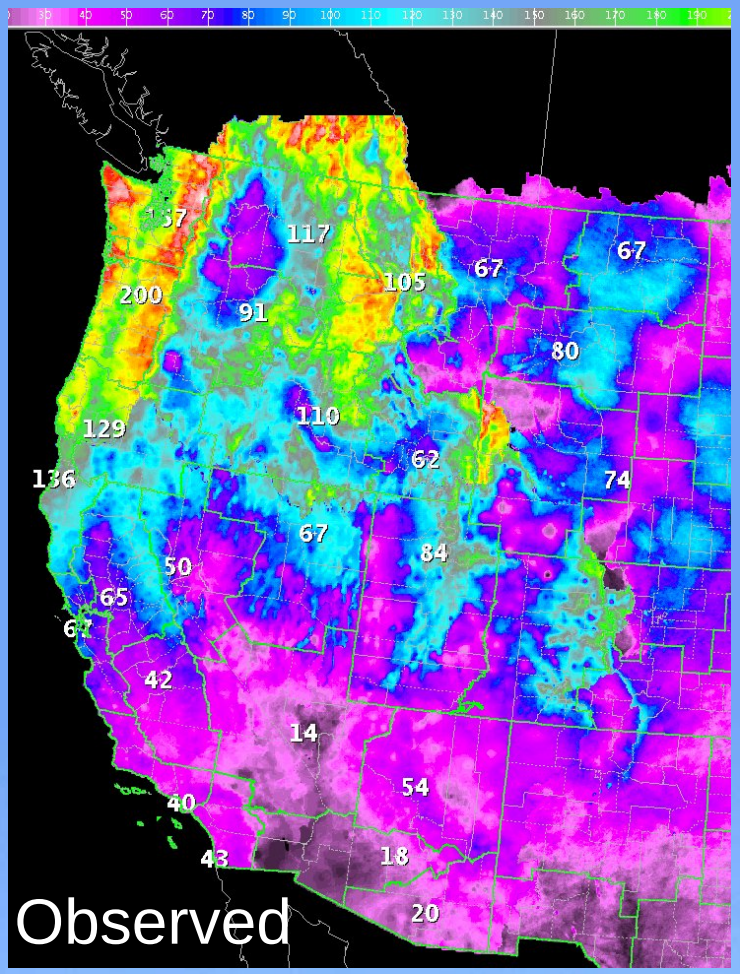
Perils of PoPs

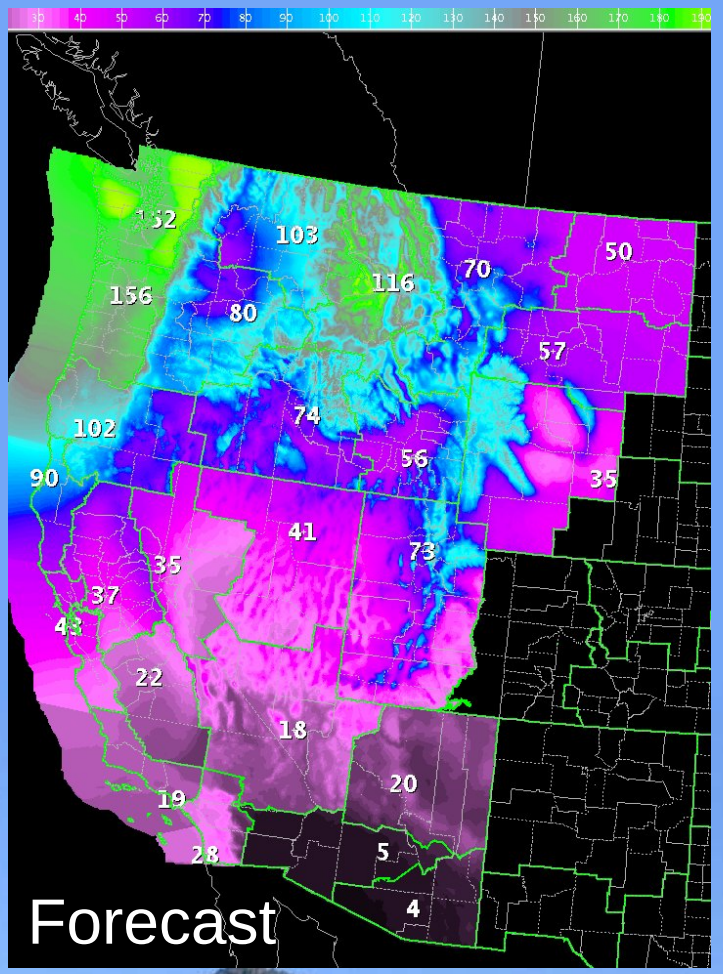
- Verification of PoP for one event is not too useful
- PoP is inherently conveying uncertainty in the forecast

Assessing Results

- Several good findings
- Local
  - See Randy's presentation coming up
- Regional
  - Systematic dry bias in PoP, especially at longer lead times
  - Wet bias in QPF

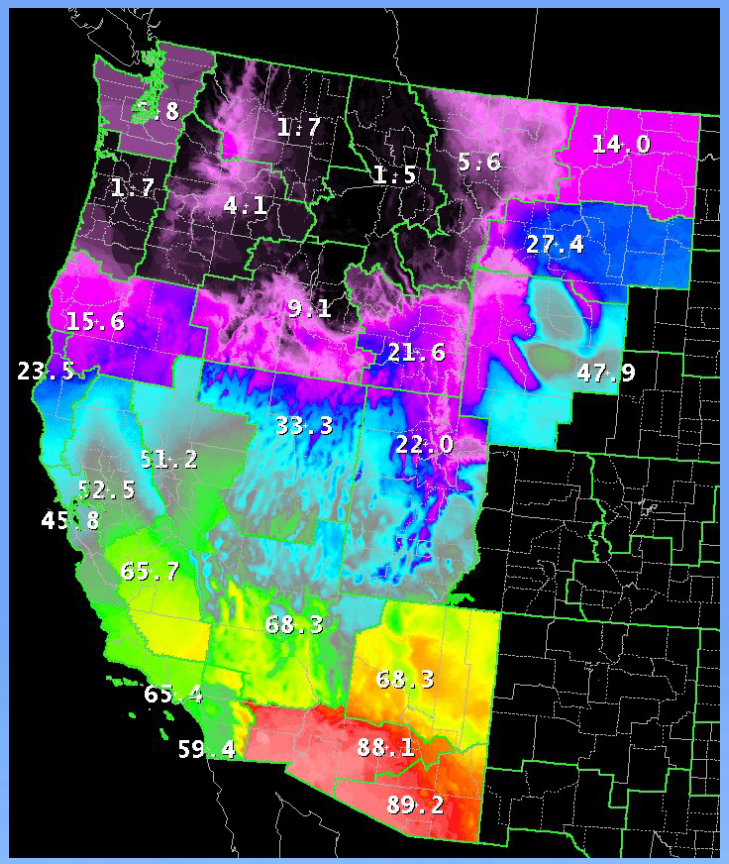
PoP Dry Bias (day 6)



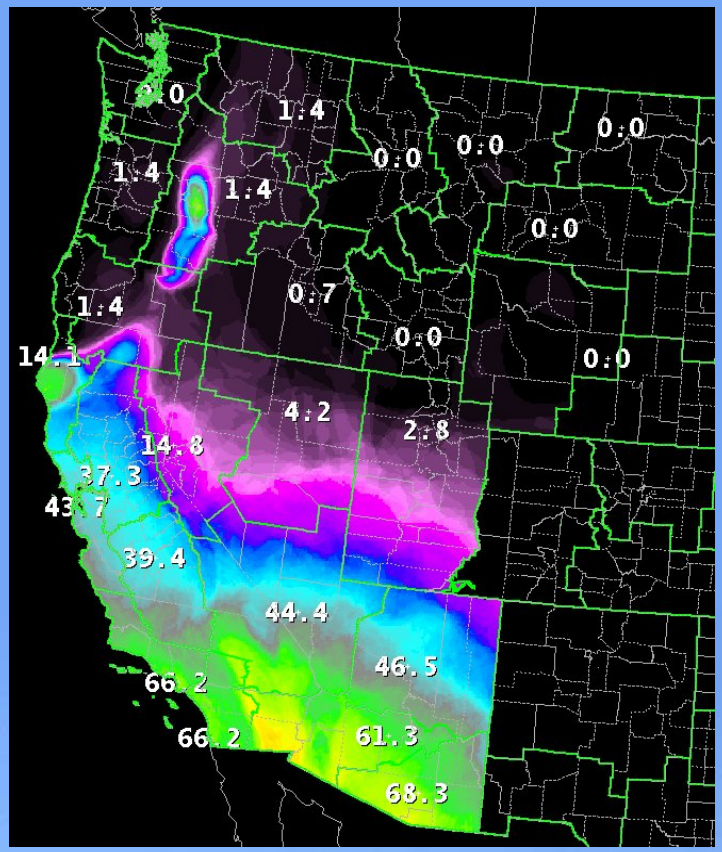


Percent of Dry Forecasts

NWS



Gridded MOS



Conclusions

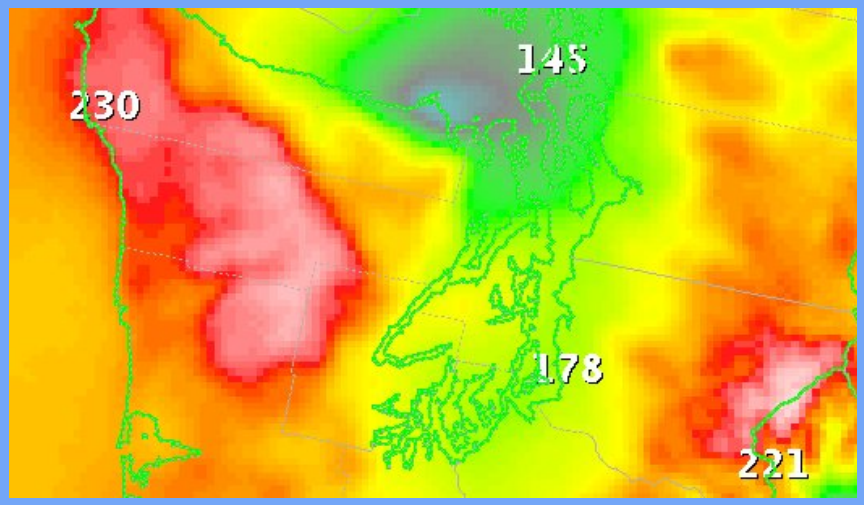
- Encourage forecasters to use climatology in the forecast
- Will have the dual-benefit of
  - improving collaboration (every office on the same page philosophically)
  - Improving accuracy (better science in the forecast)

Climatology

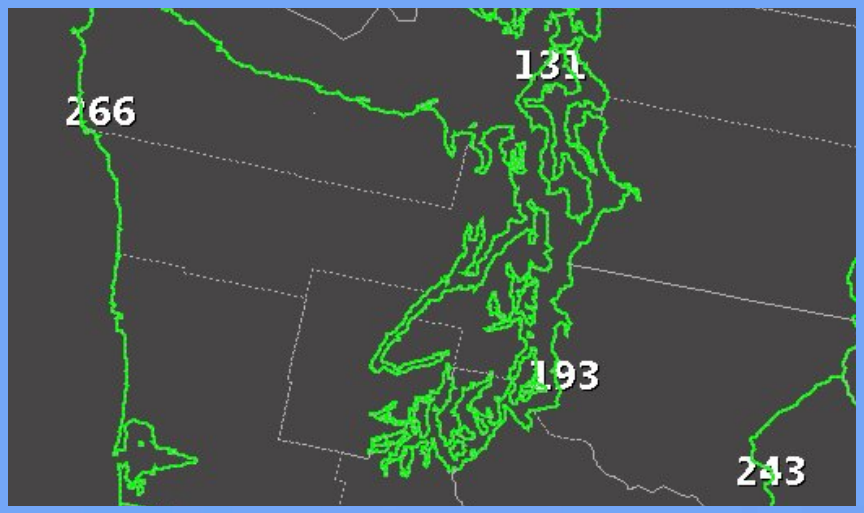
- Season long statistics confirmed that utilizing climatology could improve the forecast in two ways
  - Improve skill over small gradients where chance of precipitation may typically change radically
  - Improve skill at longer lead times where forecasters occasionally produce a dry forecast in the face of model uncertainty

Climatology

October ’07 through May ‘08



Climatology



Observed (gauges)

Collaboration

- Part of the goal of a regional verification effort was to make offices aware of their surroundings
- Therefore, we took a look at what could be gained from better collaboration

Like a Good Neighbor…

- Study of forecast discrepancy among neighboring CWA's

What if my POP forecast is 10% lower than my neighbor???

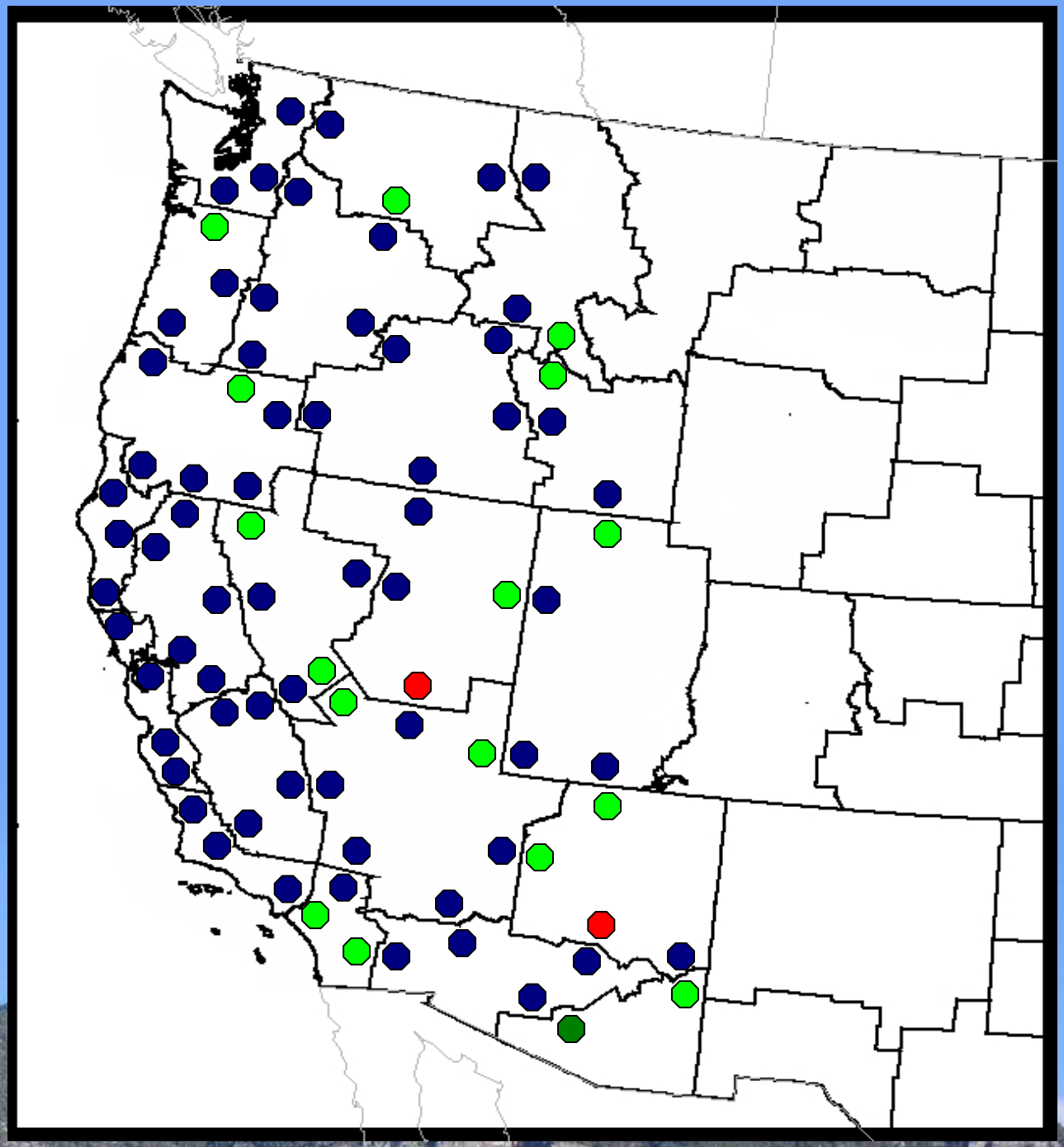
I can improve my forecast by:

Going even lower

Going a bit higher

Meeting my neighbor in the middle

Matching my neighbor



The Future

- Got buy-in from all SOO's on using climatology
- Putting our expertise into the forecast
- When we think something will happen, it often does!
- Yet sometimes our forecast doesn't reflect what we're thinking (or saying in the AFD/HWO)

The Future

- Will supply feedback to the forecasters
- Like what WFO's currently do for temperature
- But more focused on higher impact events and comparing neighbors' performance

MaxT Verification Summary for Sun, Sep 28:

Grid Time: start: Sun, Sep 28 14Z end: Mon, Sep 29 03Z
Edit Area: CWA (30476 gridpoints)

Measures of Difficulty:

Avg Anomaly:	+8.40	Avg |anomaly|: 8.49	Rank: 7 out of last 30
Avg 24hr Chg:	-1.57	Avg |24hr Chg|: 2.23	Rank:23 out of last 30
Standard Deviation:		7.93	Rank:19 out of last 30

MaxT Graphic Available Here

Period	Forecast Made	Made by	Official MAE	Official Bias	Official Percent >10° Err	Official Percent <3° Err	Official Rank among Guidance	Best Guidance	2nd Best Guidance	Worst Guidance
1 14-hr	Sun 9/28	mid	1.65	-0.15	0.0%	84.9%	3 out of 16	ECMWFBC 87.8%	SREFBC 85.8%	SREF 25.7%
2 26-hr	Sat 9/27	day	1.98	-0.28	0.0%	76.9%	5 out of 16	SREFBC 90.4%	ADJMETBC 82.9%	SREF 31.1%
3 38-hr	Sat 9/27	mid	1.70	0.27	0.0%	82.4%	3 out of 16	ECMWFBC 89.0%	MOSGuideBC 86.7%	SREF 34.5%
4 50-hr	Fri 9/26	day	1.79	-0.24	0.0%	81.5%	2 out of 16	MOSGuideBC 87.3%	SREFBC 80.1%	SREF 36.0%
5 62-hr	Fri 9/26	mid	1.93	-0.24	0.0%	78.0%	7 out of 16	ECMWFBC 86.9%	MOSGuideBC 84.6%	SREF 34.0%
6 74-hr	Thu 9/25	day kpomeroy	1.97	-0.28	0.0%	77.6%	2 out of 15	MOSGuideBC 78.1%	ECMWFBC 76.9%	ADJDGX 27.0%
7 86-hr	Thu 9/25	mid	2.43	-1.86	0.0%	67.7%	4 out of 12	ECMWFBC 77.3%	MOSGuideBC 72.3%	SREF 18.8%
8 98-hr	Wed 9/24	day	2.86	-2.44	0.0%	57.5%	10 out of 12	MOSGuideBC 73.3%	ADJDGXBC 70.4%	GFS40 52.9%
9 110-hr	Wed 9/24	mid	3.41	-3.00	0.1%	46.6%	10 out of 10	GFS40BC 76.2%	ECMWFBC 73.8%	MOSGuideBC 46.6%
10 122-hr	Tue 9/23	day	5.73	-5.67	6.5%	19.2%	10 out of 12	ADJMEX 62.8%	ECMWFBC 59.5%	GFS40 4.9%
11 134-hr	Tue 9/23	mid	4.12	-3.68	1.3%	42.1%	8 out of 10	ECMWFBC 83.6%	GFS40BC 58.4%	GFS40 27.7%
12 146-hr	Mon 9/22	day	3.26	-2.48	0.1%	51.8%	3 out of 12	DGEX 63.7%	DGEXBC 60.8%	GFS40 8.3%
13 158-hr	Mon 9/22	mid	3.99	-3.59	0.8%	41.3%	7 out of 10	DGEXBC 69.8%	DGEX 64.0%	GFS40 20.1%
14 170-hr	Sun 9/21	day	3.81	-3.07	0.4%	43.9%	6 out of 12	DGEXBC 67.6%	ADJMEX 58.9%	GFS40 23.6%
Average over past 30 days:										
1 14-hr			1.84	-0.1	0.1%	80.0%	3 out of 16	SREFBC 85.4%	NAM12BC 81.1%	SREF 31.7%

The future

- Better datasets for PoP
- Attention to PoP verification results has resulted in a couple of efforts to create bias-corrected PoP grids based on reliability of the model at each grid point

Thanks!

- Thanks to the RFC's for providing QPE data
- It is still the basis for our verification