Using the Ensemble Situational Awareness Table:

How I Learned to Stop Worrying and Love the Ensemble Mean

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NCEP Ensemble User Workshop
25 Mar 2014

Providing Tools for DSS

- Using good science, our goal is to objectively answer these questions for the forecaster:
  - What is significant in the forecast?
  - How likely is it to happen?
  - What are the potential impacts?

Climatological Perspectives

- "R-Climate": reanalysis-climate
  - How does the model forecast compare to typical conditions at this time of year?
  - "You don't usually get a trough this deep in September."
- "M-Climate": model-climate
  - How does the model forecast compare to what is typically forecast at the same lead time, and this time of year?
  - "The model rarely predicts this much precipitation at a 5-day lead time."

R-Climate Calculations

- Goal: quickly identify where/when the forecast departs significantly from climatology.

- NAEFS ensemble mean is compared to the 1979-2009 Climate Forecast System Reanalysis.
  - 1.0x1.0-degree NAEFS interpolated to 0.5 deg
  - Forecast is compared the CFSR for a 21-day window centered on the valid time.
  - 00Z compared only to 00Z analyses, 06Z to 06Z, etc.

User Interface

National Weather Service
Ensemble Situational Awareness Table

Help | Archive | Horizontal Tables | Verification | Permalink

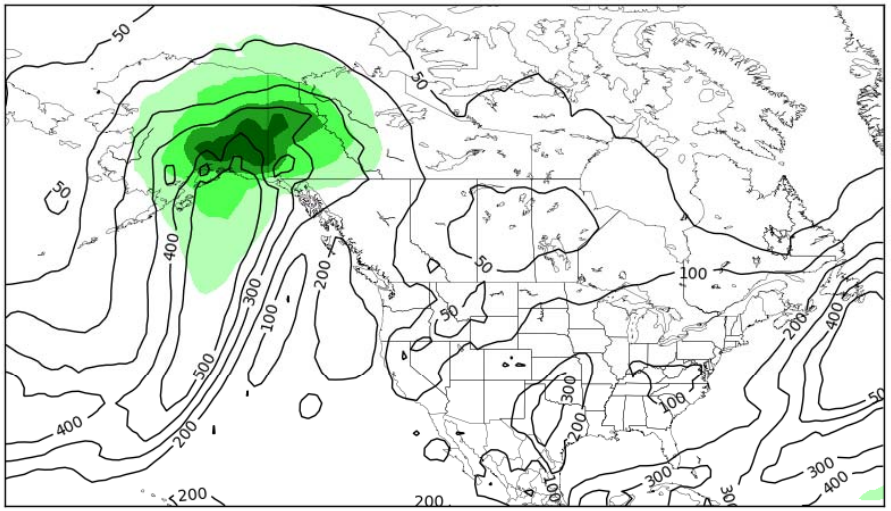
Model Run: Oct 23, 2013 00Z | Table Region: North America | Plot Region: North America | Output: NAEFS Standardized Anomaly | View Table

Fcst Hr: 132 Valid: Mon Oct 28 6:00 AM MDT

WFO North America Table Oct 23, 2013 00Z Run

			Z	T	U	V	WSP	SLP	Q	PW	IVT
6	Wed 23rd	06Z	-3.0	3.5	-3.4	3.5	3.5	-3.0	3.7	3.0	4.3
12		12Z	-3.2	3.4	-3.4	3.7	3.5	-3.1	3.8	3.2	5.0
18		18Z	-3.3	3.4	-3.5	4.1	5.5	-3.2	3.7	2.9	5.8
24	Thu 24th	00Z	-3.4	3.2	-4.0	4.0	5.5	-3.3	3.4	2.7	5.9
30		06Z	-3.5	-3.2	-4.1	3.7	3.5	-3.4	3.3	2.7	5.6
36		12Z	-3.7	-3.1	-4.0	3.2	4.1	-3.5	3.5	2.9	5.1
42		18Z	-3.5	-3.2	-4.1	-3.5	3.8	-3.3	3.7	2.9	4.8
48	Fri 25th	00Z	-3.5	-3.2	3.3	3.3	3.8	-3.4	4.2	2.8	4.3
54		06Z	-4.2	-3.6	3.4	-3.2	3.7	-4.0	4.2	3.0	3.7
60		12Z	-4.2	-3.8	-4.1	3.3	3.8	-4.1	3.9	3.1	3.6
66		18Z	-4.0	-3.7	-3.9	3.5	3.9	-3.9	3.9	2.9	3.6
72	Sat 26th	00Z	-3.8	-3.8	-3.1	3.2	3.1	-3.4	3.3	2.8	3.4
78		06Z	-4.0	-4.0	3.0	2.9	3.8	-2.8	3.2	2.6	3.8
84		12Z	-3.9	-3.8	3.1	2.8	3.4	-2.9	2.6	2.3	4.4
90		18Z	-3.7	-3.4	3.2	3.1	3.5	-2.8	3.0	2.7	4.5
96	Sun 27th	00Z	-3.3	-3.0	3.2	3.6	3.3	-2.6	3.7	3.6	4.7
102		06Z	-2.9	2.9	4.1	4.0	3.9	2.6	4.4	4.2	5.6
108		12Z	3.2	3.1	4.6	4.3	4.7	2.7	4.7	4.4	6.4
114		18Z	3.4	3.3	5.2	4.3	5.0	2.6	5.5	4.8	7.3
120	Mon 28th	00Z	3.6	3.4	5.5	4.2	5.4	2.4	6.0	4.3	8.3
126		06Z	3.7	3.5	5.2	-4.2	4.9	2.4	5.9	5.5	9.4
132		12Z	3.7	3.2	5.0	-4.2	5.3	-2.8	5.5	4.8	9.7
138		18Z	3.5	3.0	4.6	-4.2	4.7	-3.3	5.2	3.8	9.5
144	Tue 29th	00Z	3.3	3.0	4.3	-4.0	4.1	-3.3	4.7	3.7	8.0
150		06Z	3.1	2.9	3.8	-3.7	3.8	-3.1	3.7	3.1	6.5
156		12Z	2.9	2.8	3.3	-3.3	3.2	-2.6	3.1	2.6	5.5
162		18Z	2.7	2.5	3.2	-2.9	2.8	-2.3	2.7	2.2	4.4
168	Wed 30th	00Z	-2.5	2.3	2.8	-2.6	2.3	-2.4	2.3	1.9	3.4
174		06Z	2.4	2.1	-2.3	-2.2	1.9	-2.4	2.1	1.7	2.9
180		12Z	2.3	2.0	2.0	-1.8	1.7	-2.2	2.0	1.7	2.3
186		18Z	2.3	2.3	2.2	-1.6	1.6	-2.1	2.0	1.7	1.8
192	Thu 31st	00Z	2.2	2.1	2.0	-1.5	1.6	-2.0	1.9	1.6	1.8
198		06Z	2.1	2.1	2.0	-1.4	1.6	-1.9	1.9	1.7	1.7
204		12Z	2.0	2.0	1.8	1.4	1.5	-1.9	1.7	1.5	1.4
210		18Z	1.9	2.1	1.6	-1.3	1.4	-1.9	1.9	1.3	1.1
216	Fri 1st	00Z	-2.2	2.1	1.4	-1.1	1.1	-2.6	1.8	1.3	1.1
222		06Z	-2.2	1.9	1.2	-1.1	1.0	-2.4	1.8	1.2	0.8
228		12Z	-2.5	-1.9	1.2	1.0	0.8	-2.6	1.6	1.2	0.8
234		18Z	-2.5	2.0	1.1	0.9	0.7	-2.6	1.6	1.1	0.8
240	Sat 2nd	00Z	-2.6	1.9	-1.0	-0.9	0.7	-2.9	1.7	1.1	0.6

NAEFS Mean Integrated WV Transport ($kgm^{-1}s^{-1}$) and Standardized Anomaly
HOUR 132 - VALID 12:00 UTC Mon Oct 28 2013



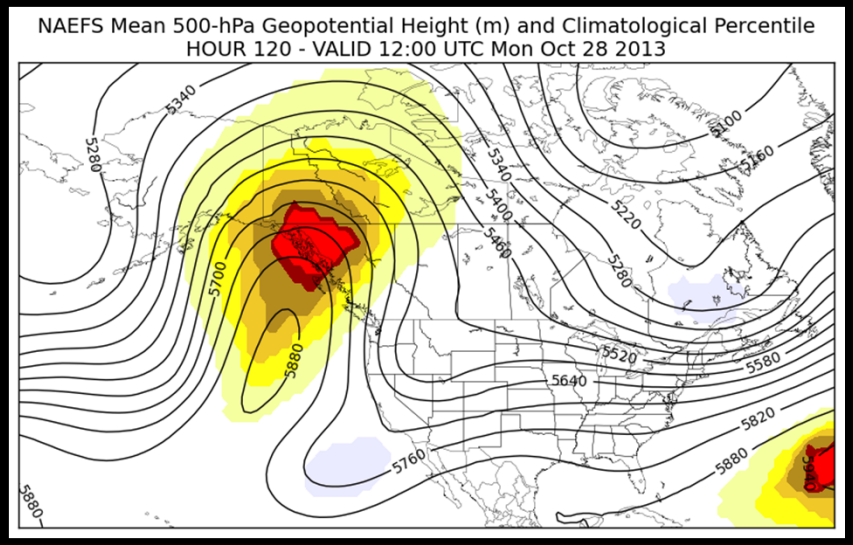
Relative to the 18-Oct to 08-Nov 1979-2009 CFSR climatology

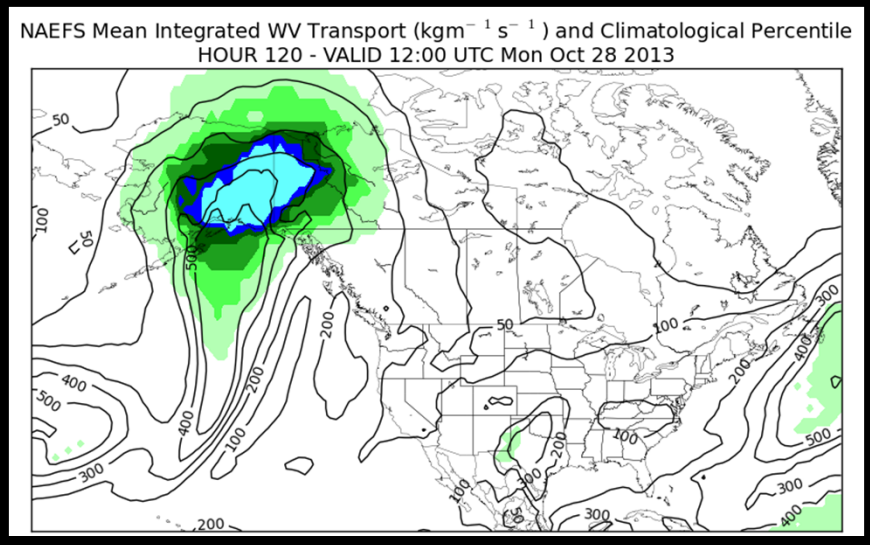
http://ssd.wrh.noaa.gov/satable

500-hPa Height

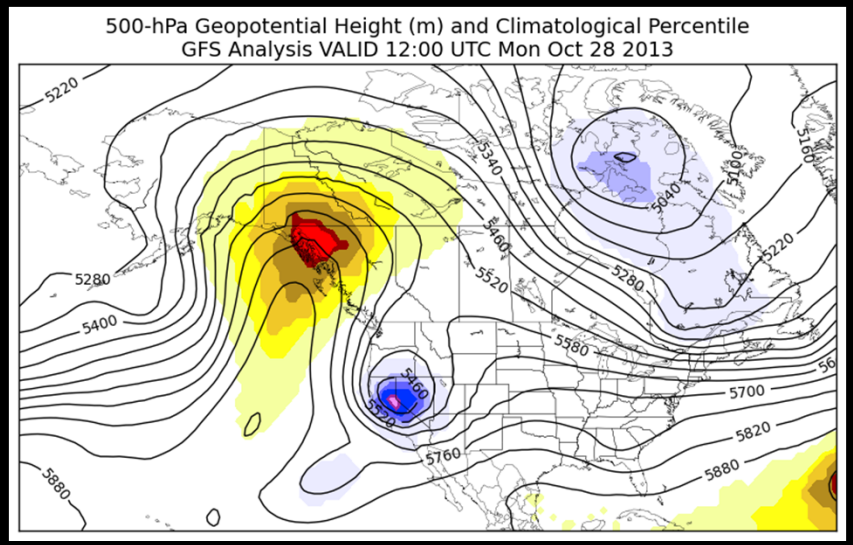
Integrated Water Vapor Transport

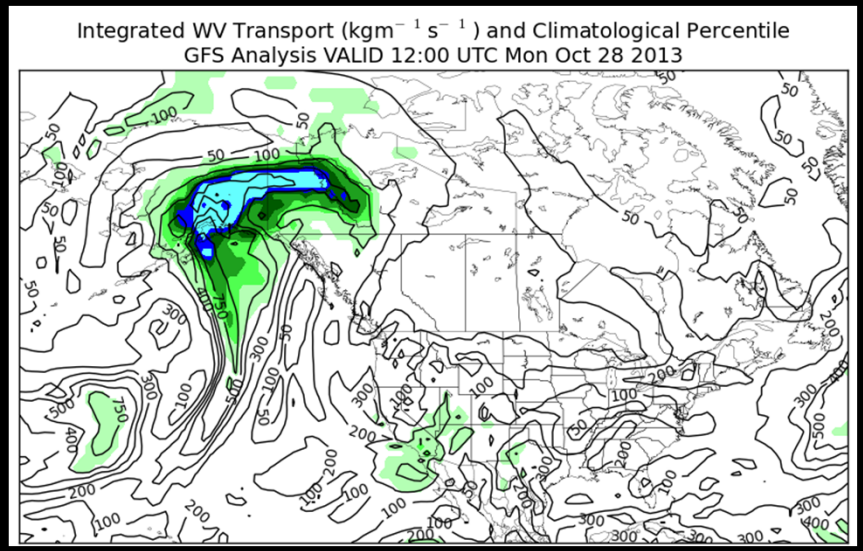
Hour 120

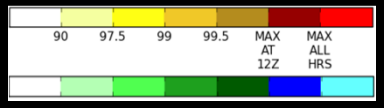




Analysis



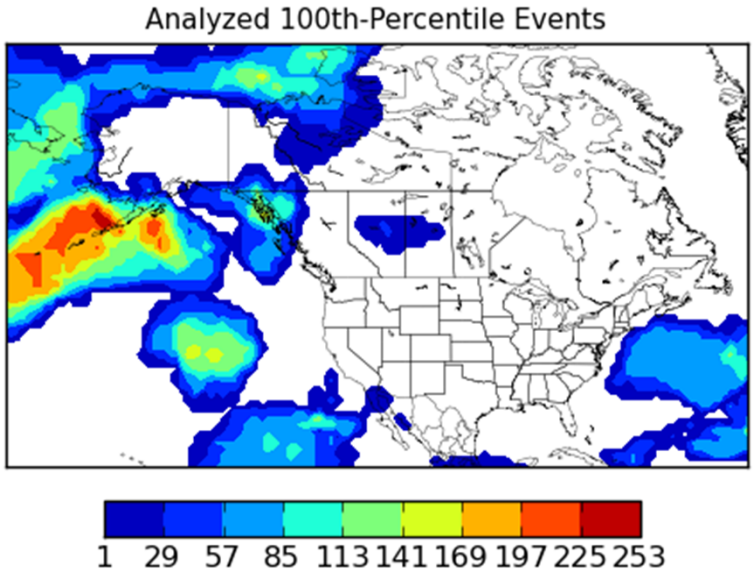


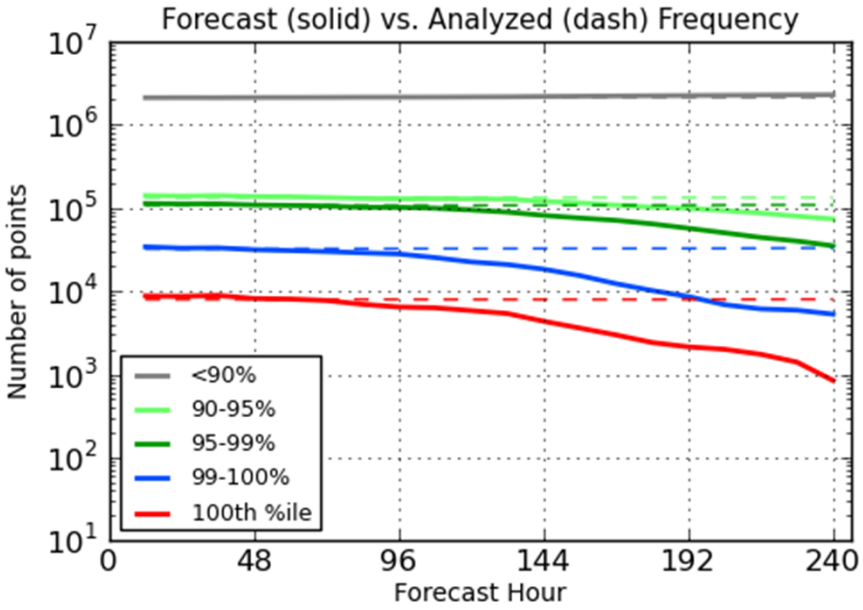


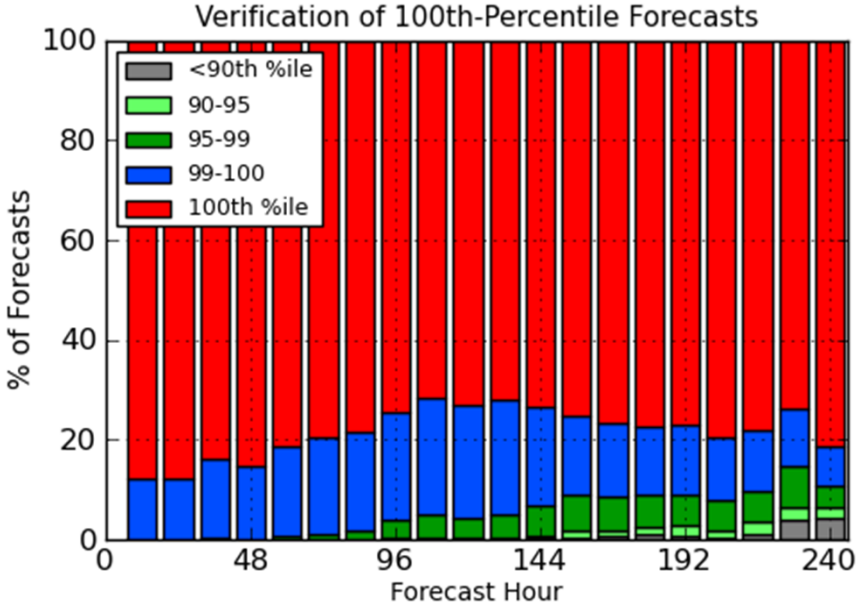
Better living through verification

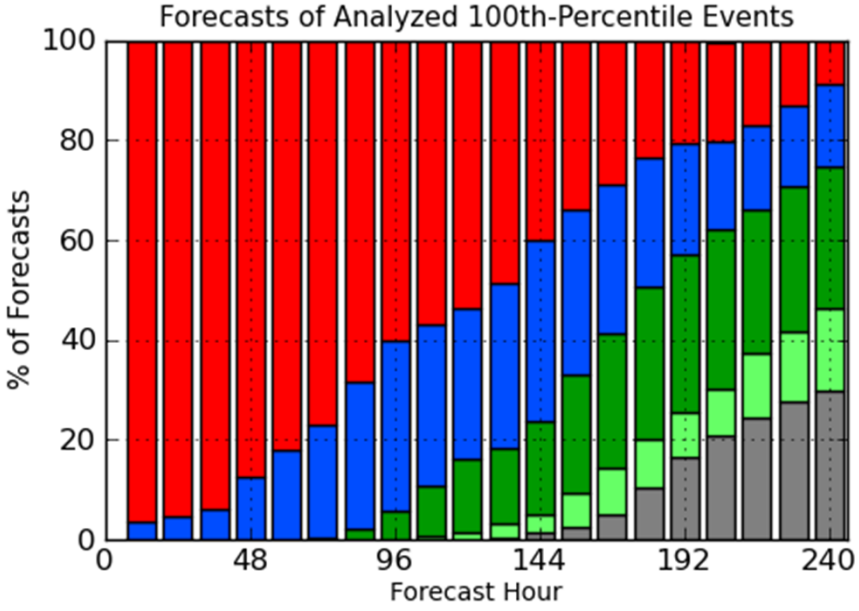
- How well can we anticipate significant events with a multi-model ensemble?
- Focus on Zero and 100th-percentile events:
  - outside the climatological distribution *for this time of year* (3-week period centered on valid time, 30-year CFSR climatology)
  - Rarely all-time highs or lows, but usually significant enough to be associated with impacts.
- Overall picture is low POD and low FAR, but let's explore the details…

NAEFS-Mean Verification: 500-hPa Geopotential Height
North America Domain (10/01/2013 - 03/14/2014)

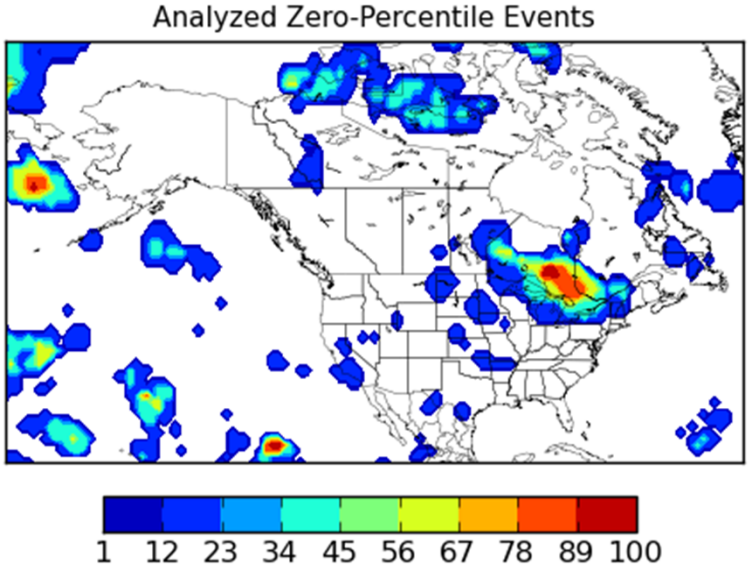


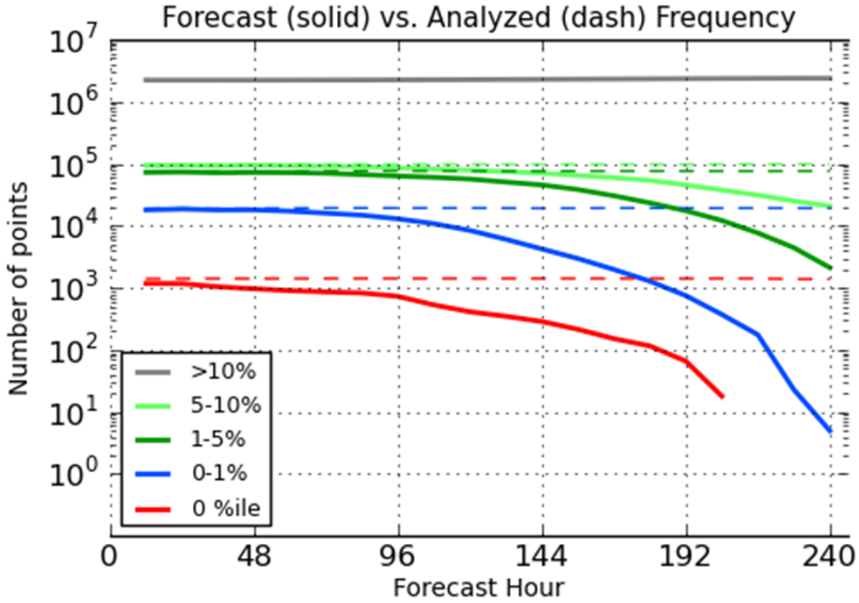


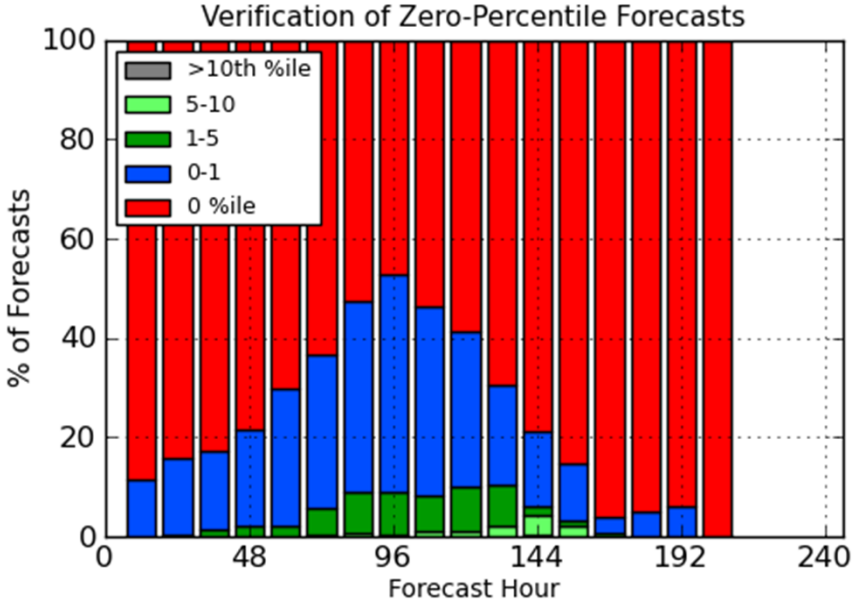


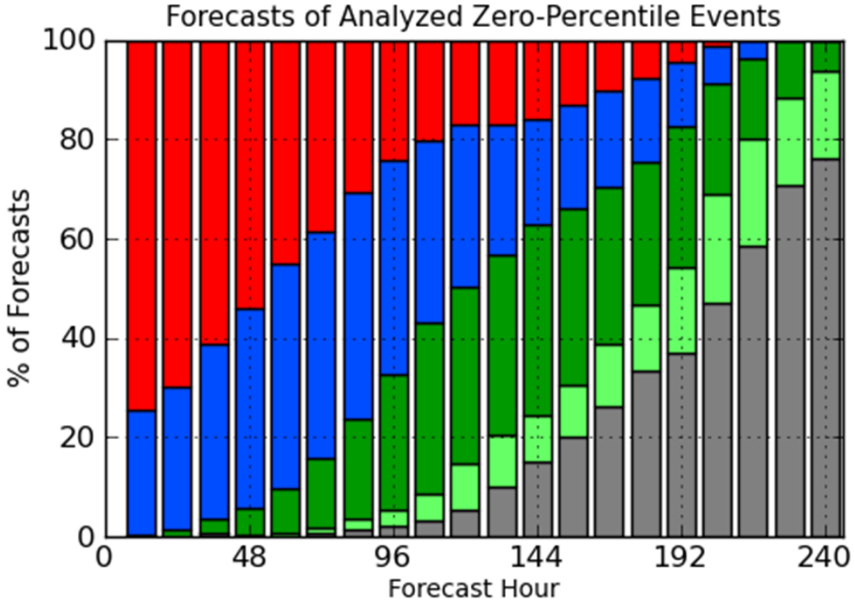


NAEFS-Mean Verification: 500-hPa Geopotential Height
North America Domain (10/01/2013 - 03/14/2014)

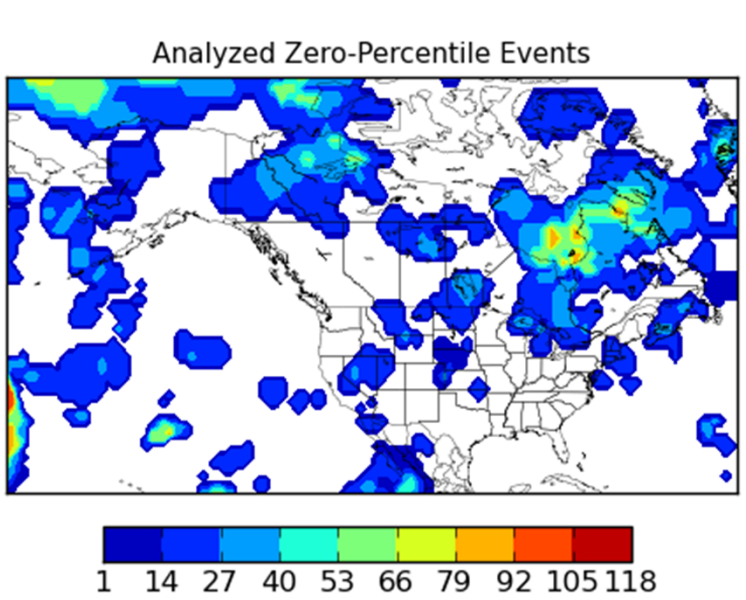


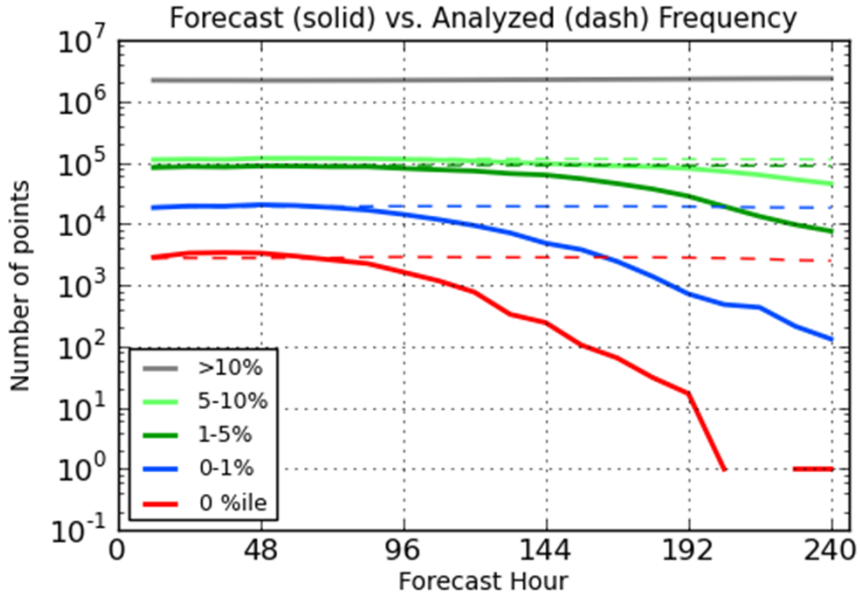


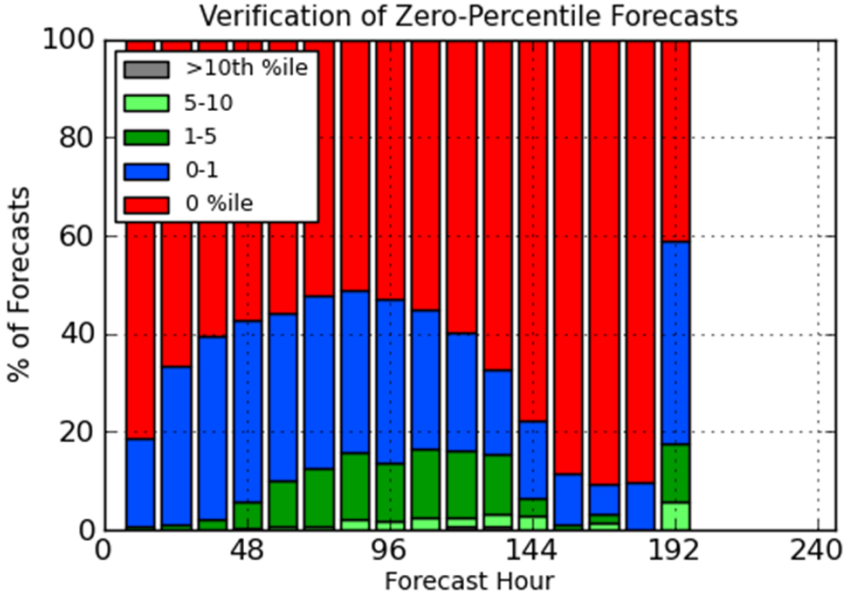


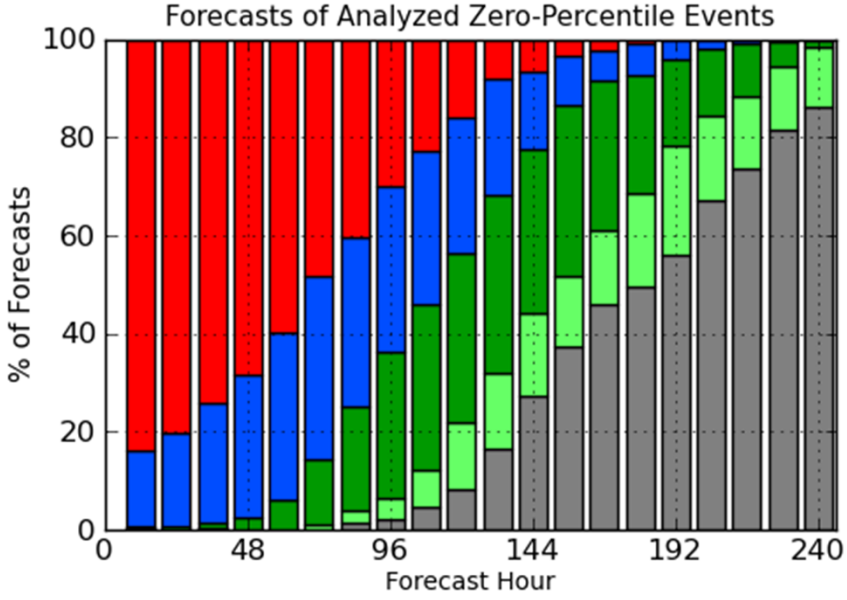


NAEFS-Mean Verification: MSL Pressure
North America Domain (10/01/2013 - 03/14/2014)

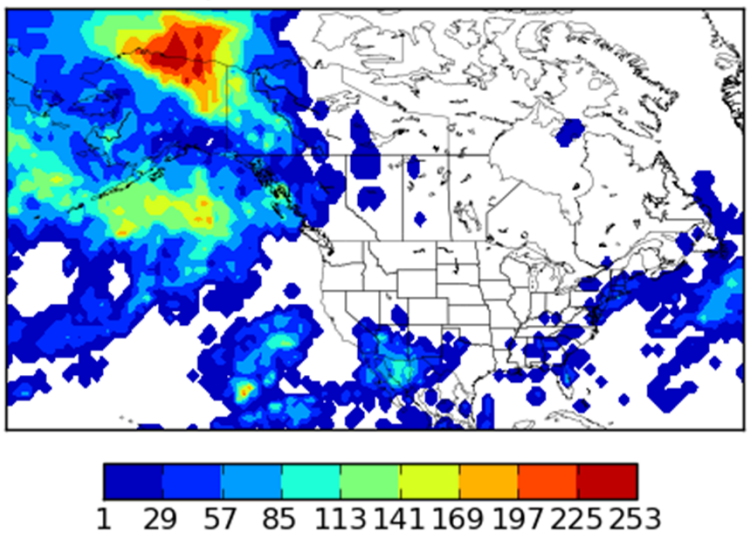


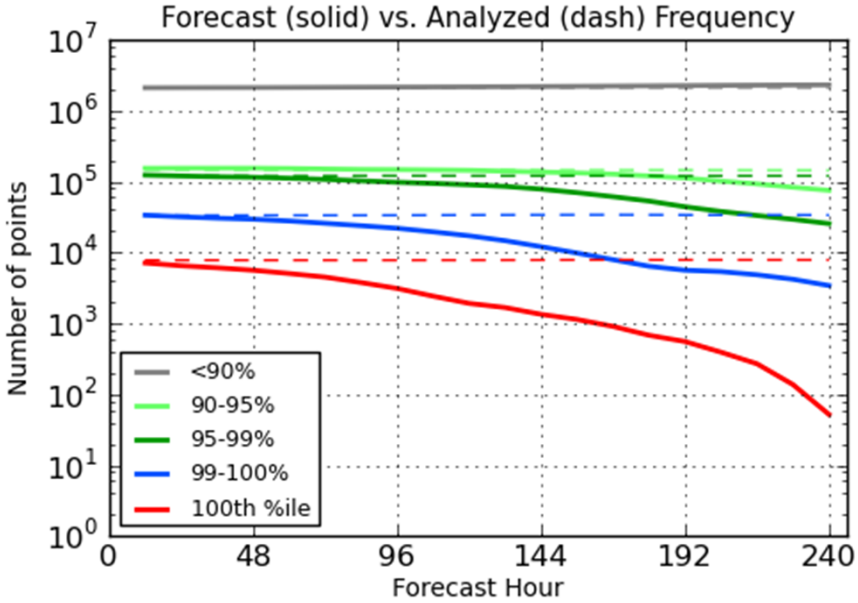


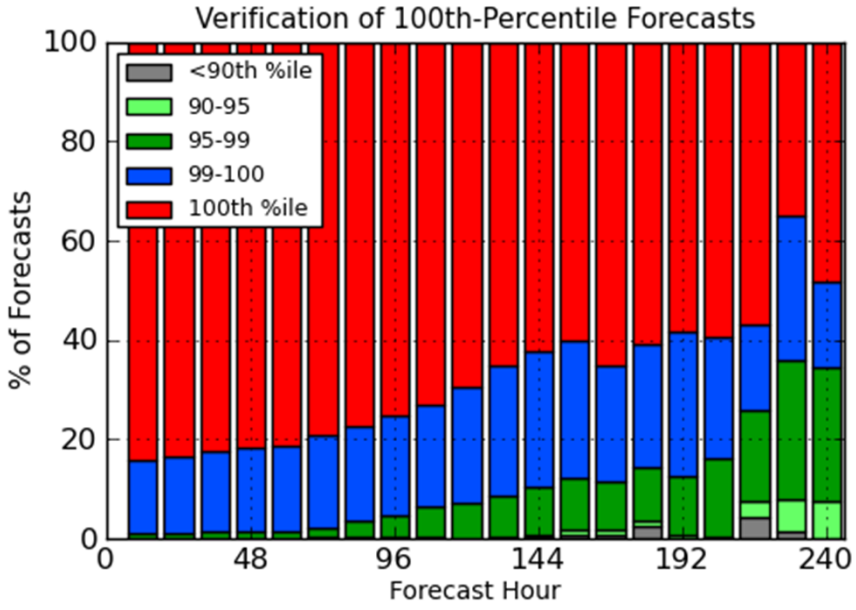


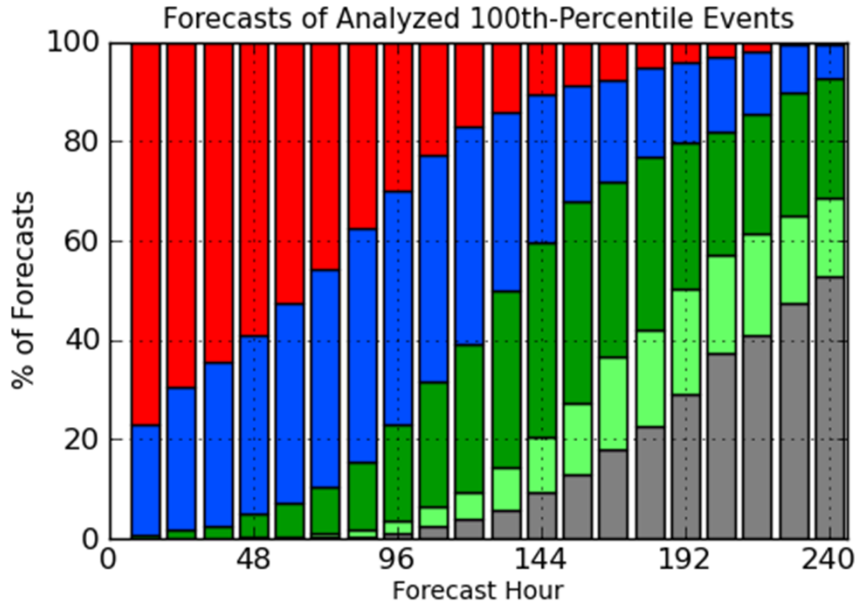


NAEFS-Mean Verification: 700-hPa Temperature
North America Domain (10/01/2013 - 03/14/2014)

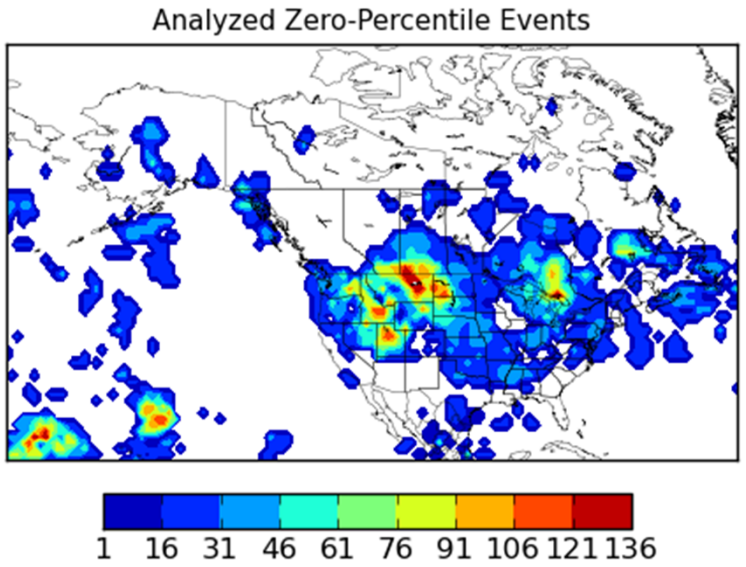


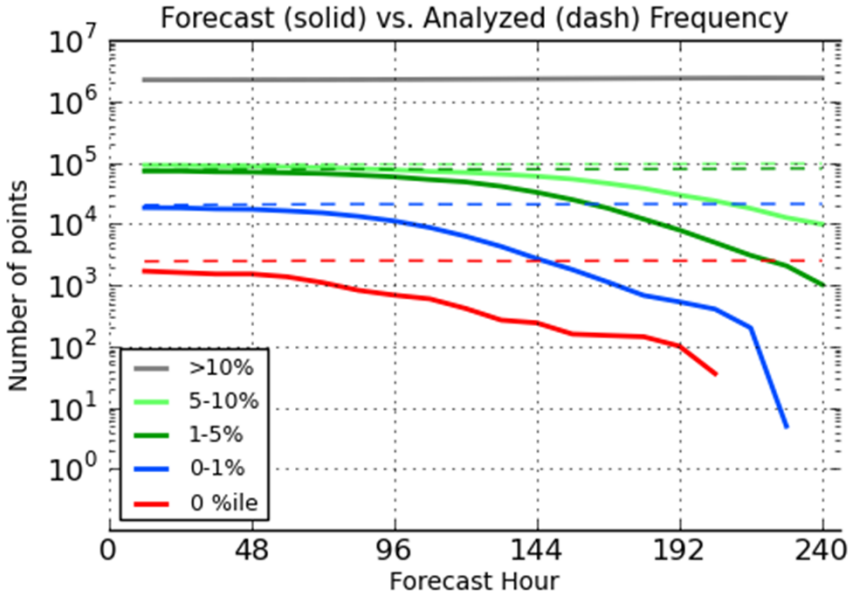


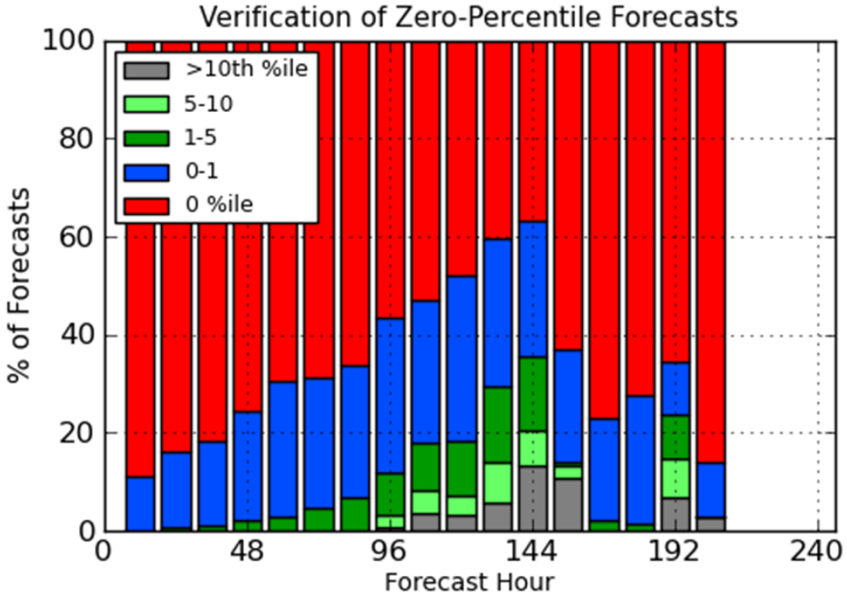


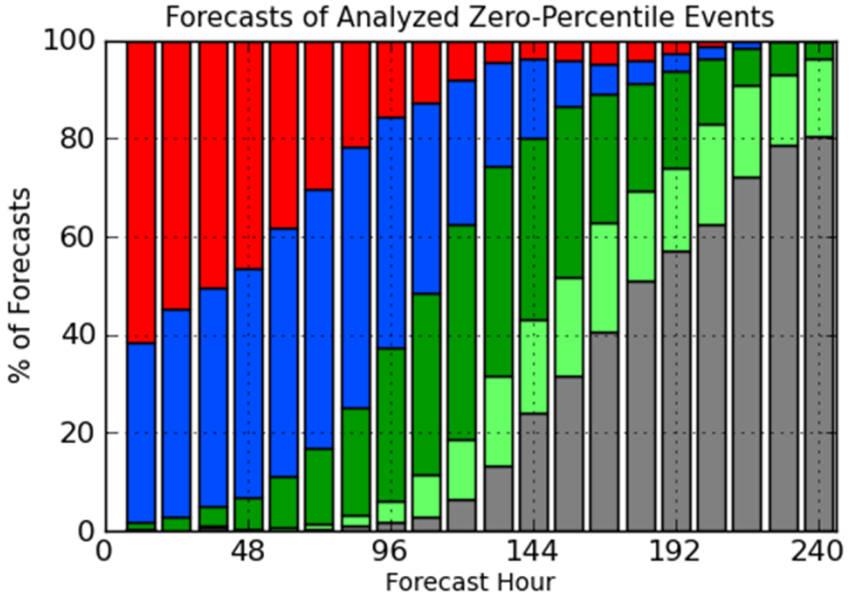


NAEFS-Mean Verification: 700-hPa Temperature
North America Domain (10/01/2013 - 03/14/2014)

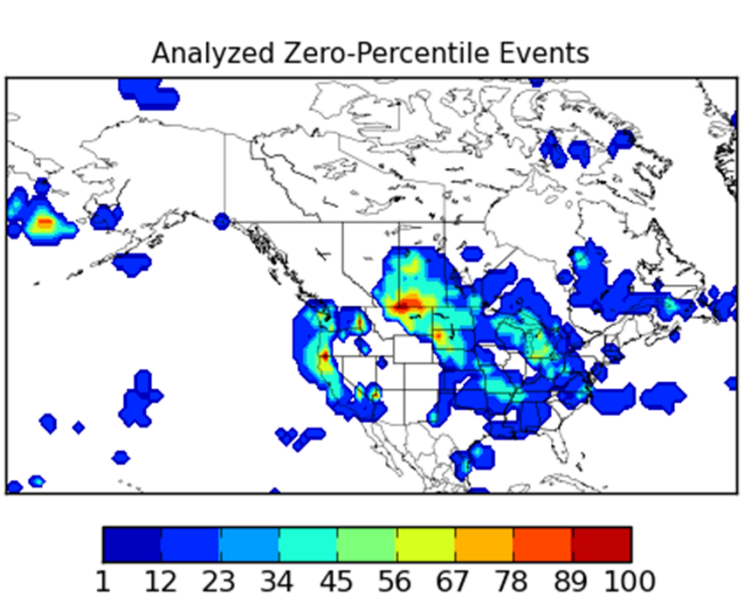


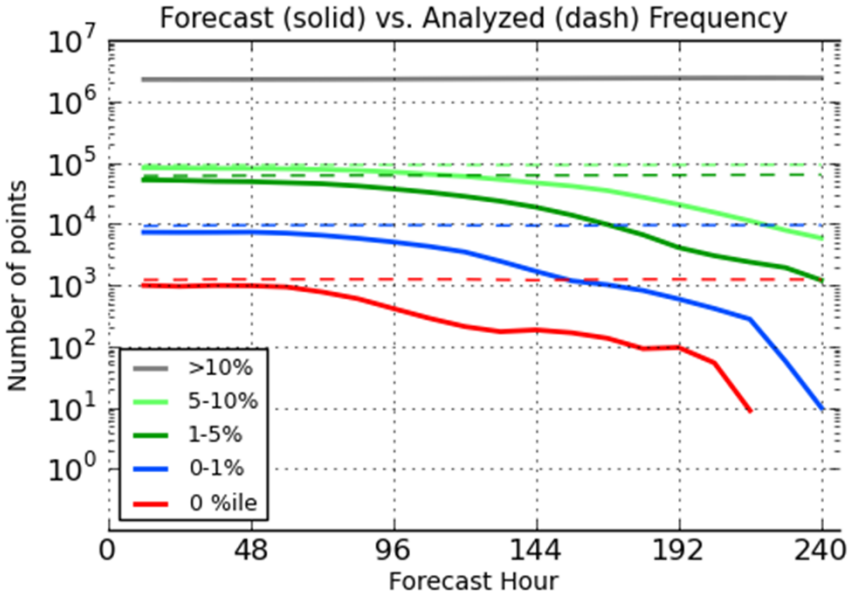


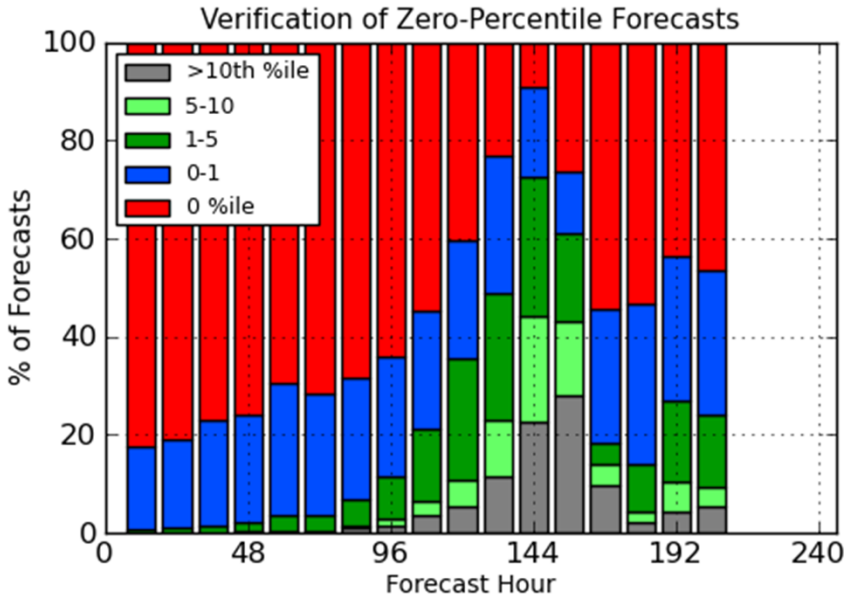


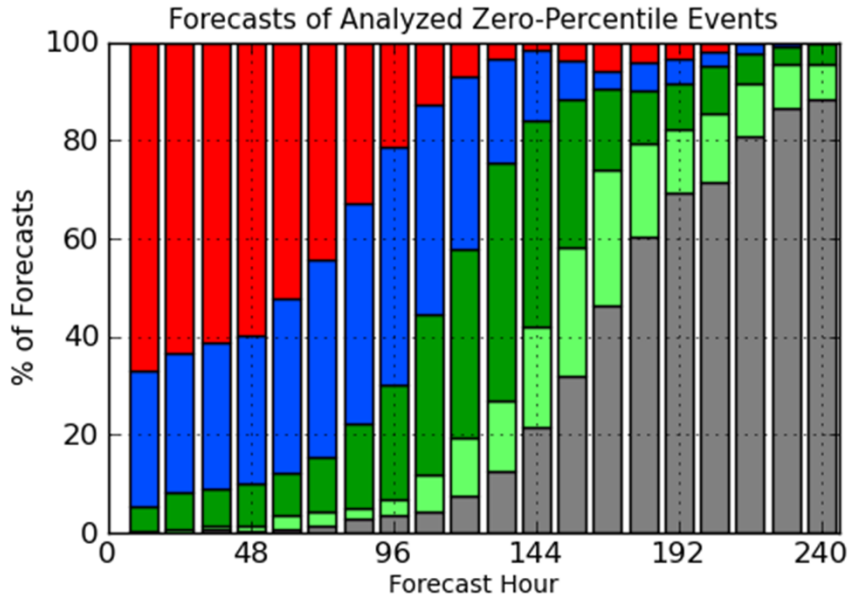


NAEFS-Mean Verification: 850-hPa Temperature
North America Domain (10/01/2013 - 03/14/2014)

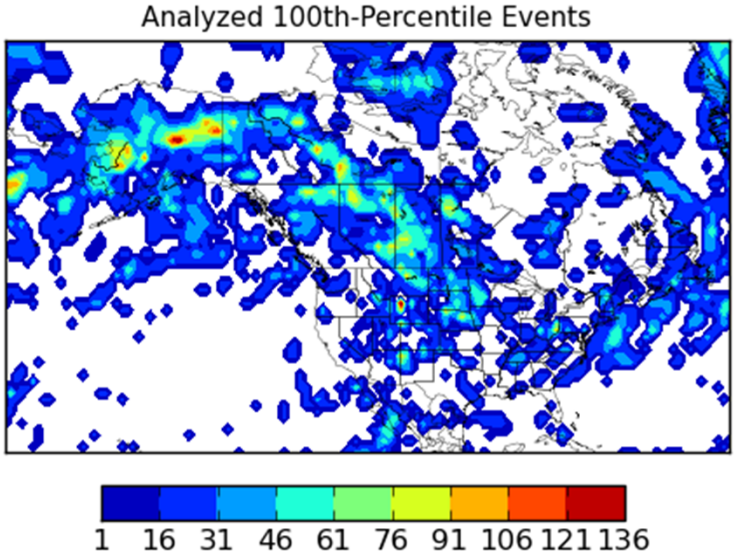


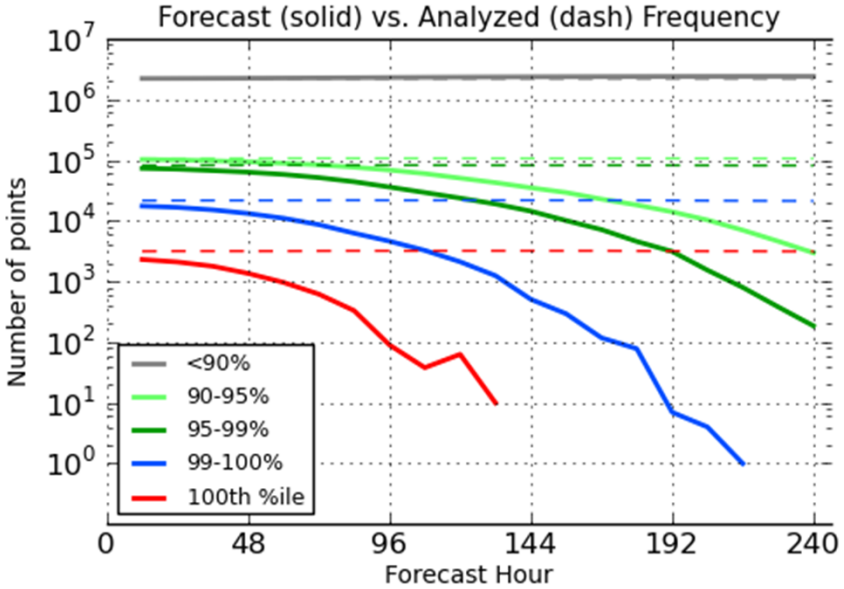


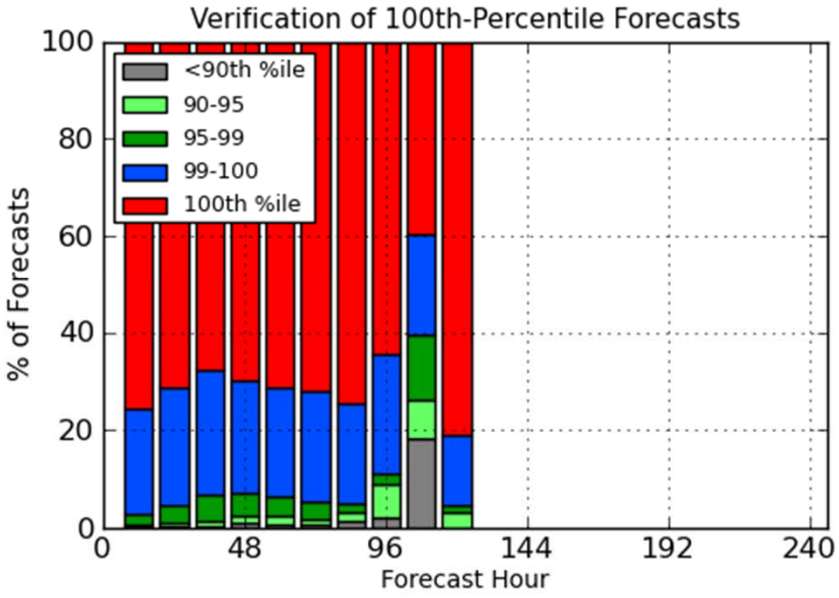


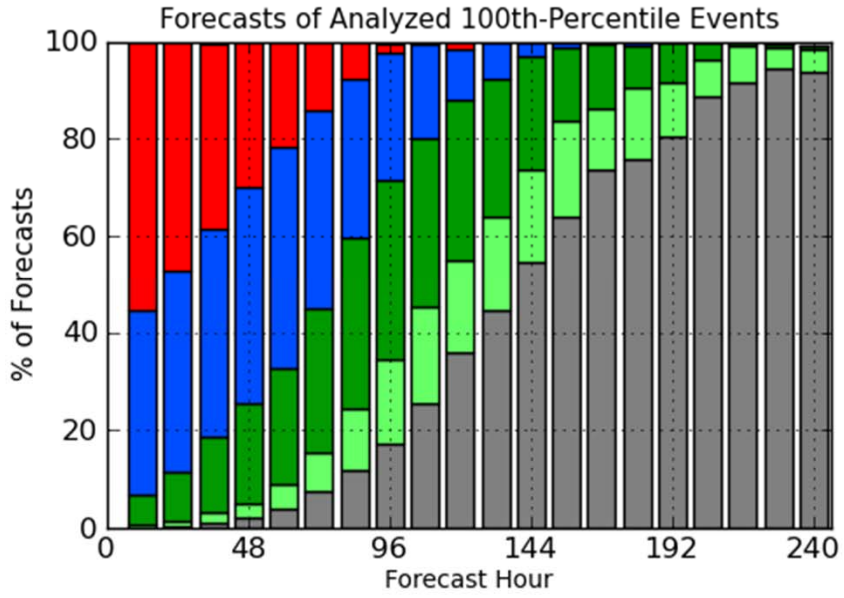


NAEFS-Mean Verification: 700-hPa Wind Speed
North America Domain (10/01/2013 - 03/14/2014)

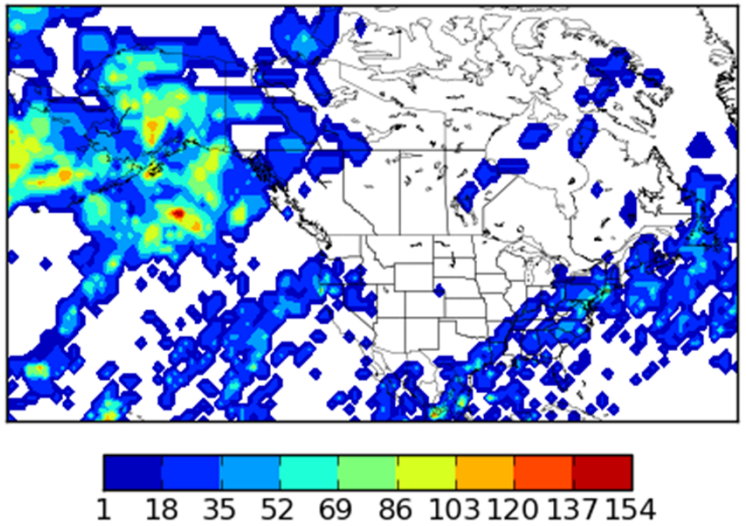


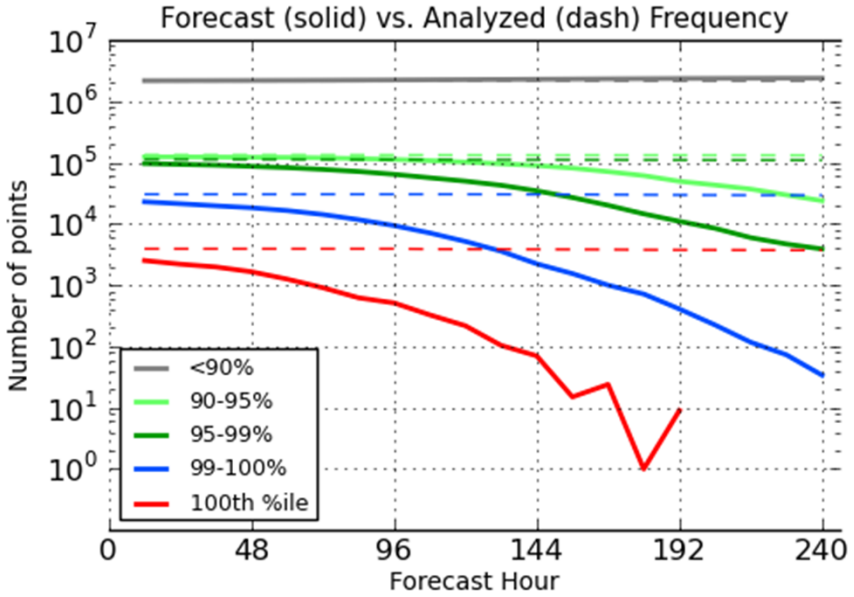


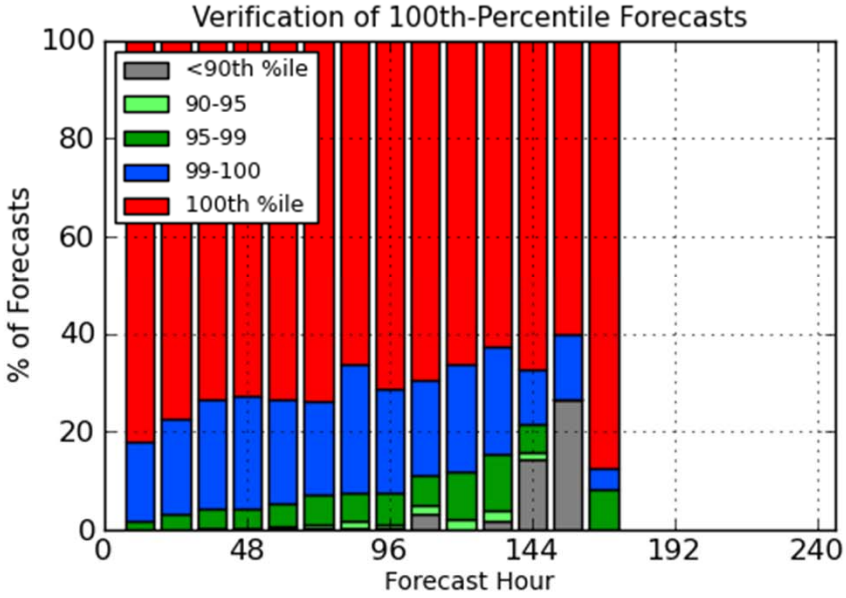


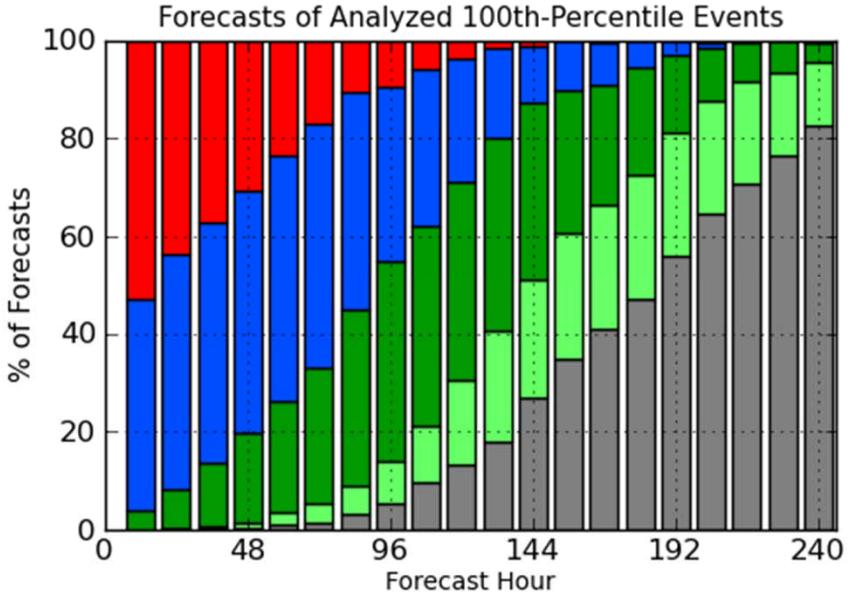


NAEFS-Mean Verification: Precipitable Water
North America Domain (10/01/2013 - 03/14/2014)

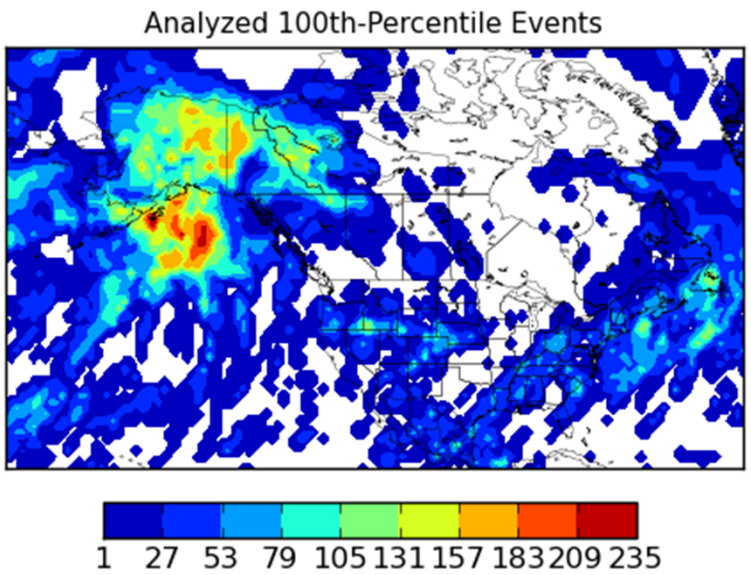


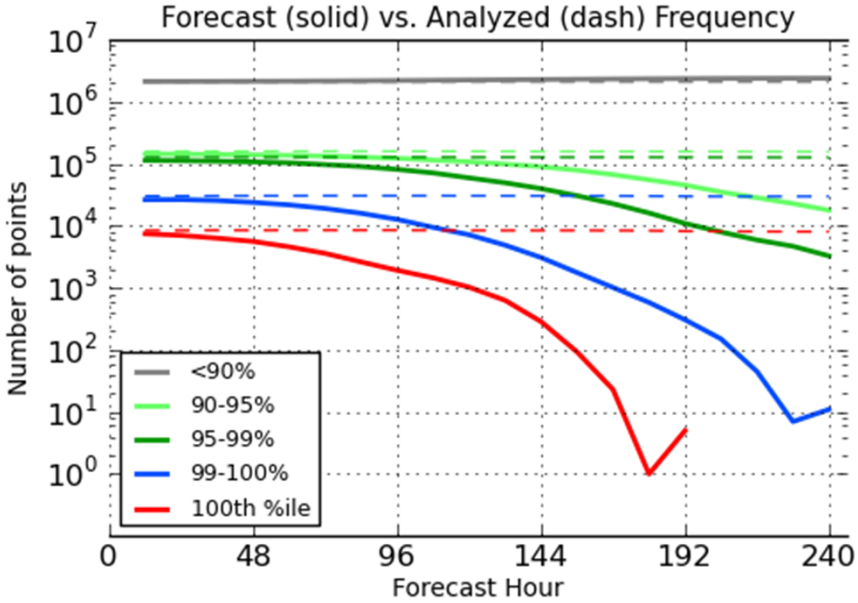


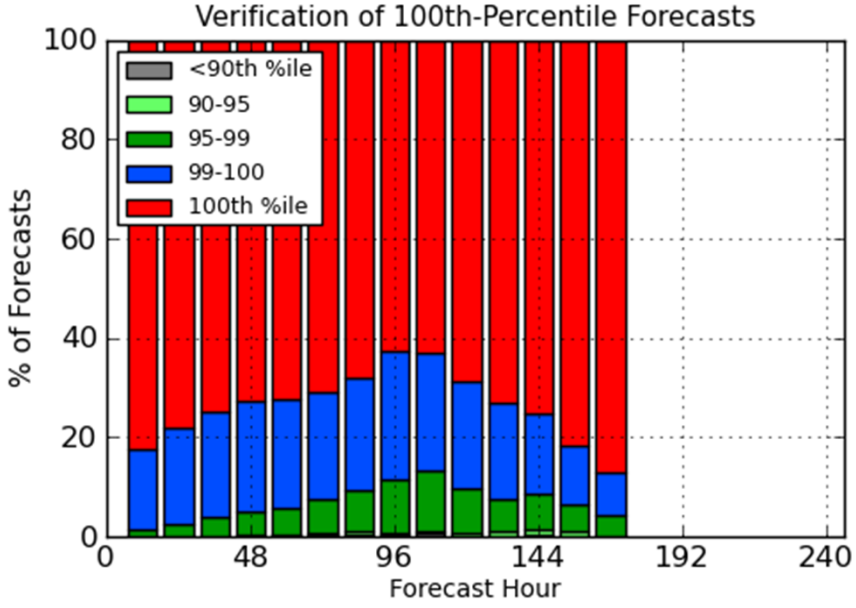


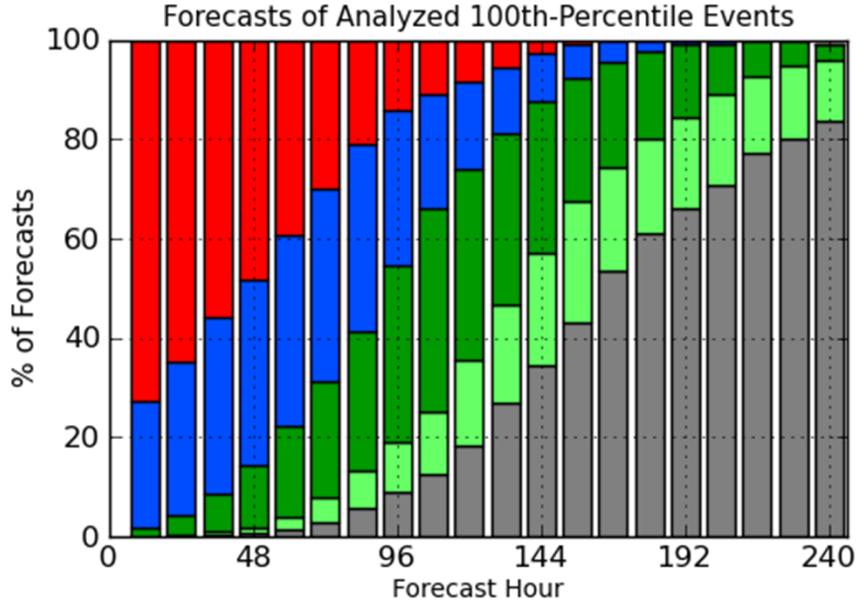


NAEFS-Mean Verification: Integrated Water Vapor Transport
North America Domain (10/01/2013 - 03/14/2014)









Coming Soon

- More stable and publicly accessible website (please be patient)
- Archived forecasts back to 1 Jan 2013
- Expanded set of verification graphics
- Possibly a convective table

Questions/comments

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