



LAMP improvements for ceiling height and visibility guidance*

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Outline



1. Summary: April 2017 Implementation
2. Status: Fall 2017 Implementation
3. Future plans

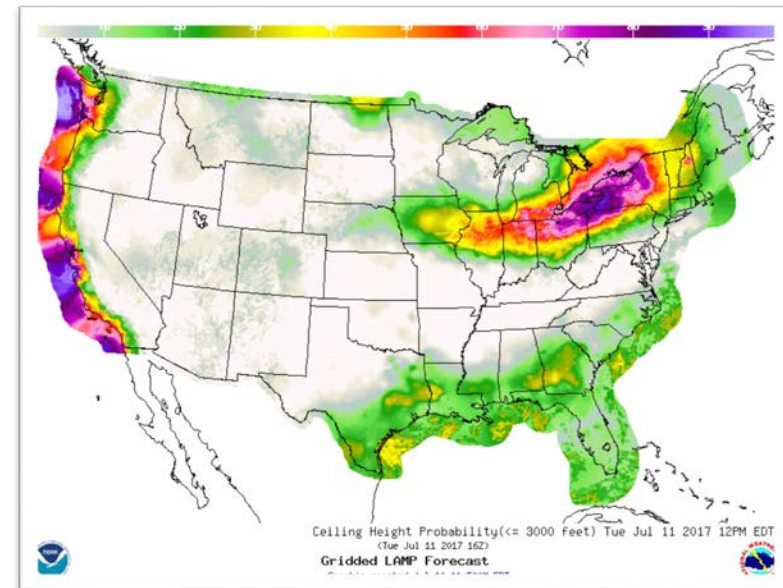


April 2017 Implementation



LAMP and GLMP Upgrade to Ceiling and Visibility (aka LAMP/HRRR Meld) guidance over the CONUS:

- Improvements due to utilizing **High Resolution Rapid Refresh (HRRR)** model output
- Implemented **April 2017**
- Resulted in improvements to:
 - Station-based ceiling and visibility guidance in the CONUS
 - Gridded ceiling heights analyses and forecasts
 - Gridded visibility analyses and forecasts
 - Gridded LAMP probability forecasts:
 - Probability of ceiling < 500 ft.
 - Probability of ceiling < 1000 ft.
 - Probability of ceiling \leq 3000 ft.
 - Probability of visibility < 1 mile
 - Probability of visibility < 3 miles
 - Probability of visibility \leq 5 miles

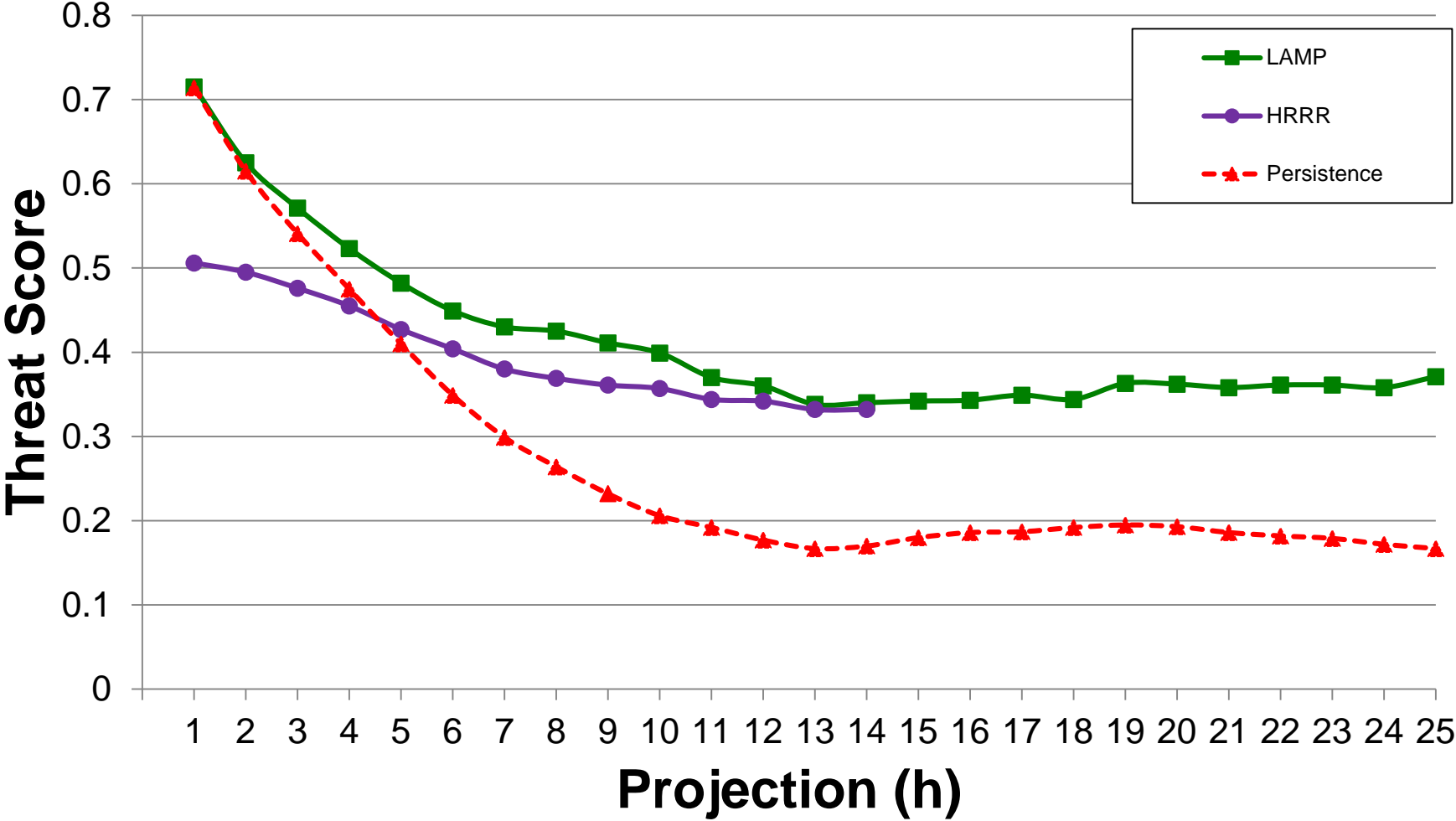




Ceiling & Visibility: Threat Scores



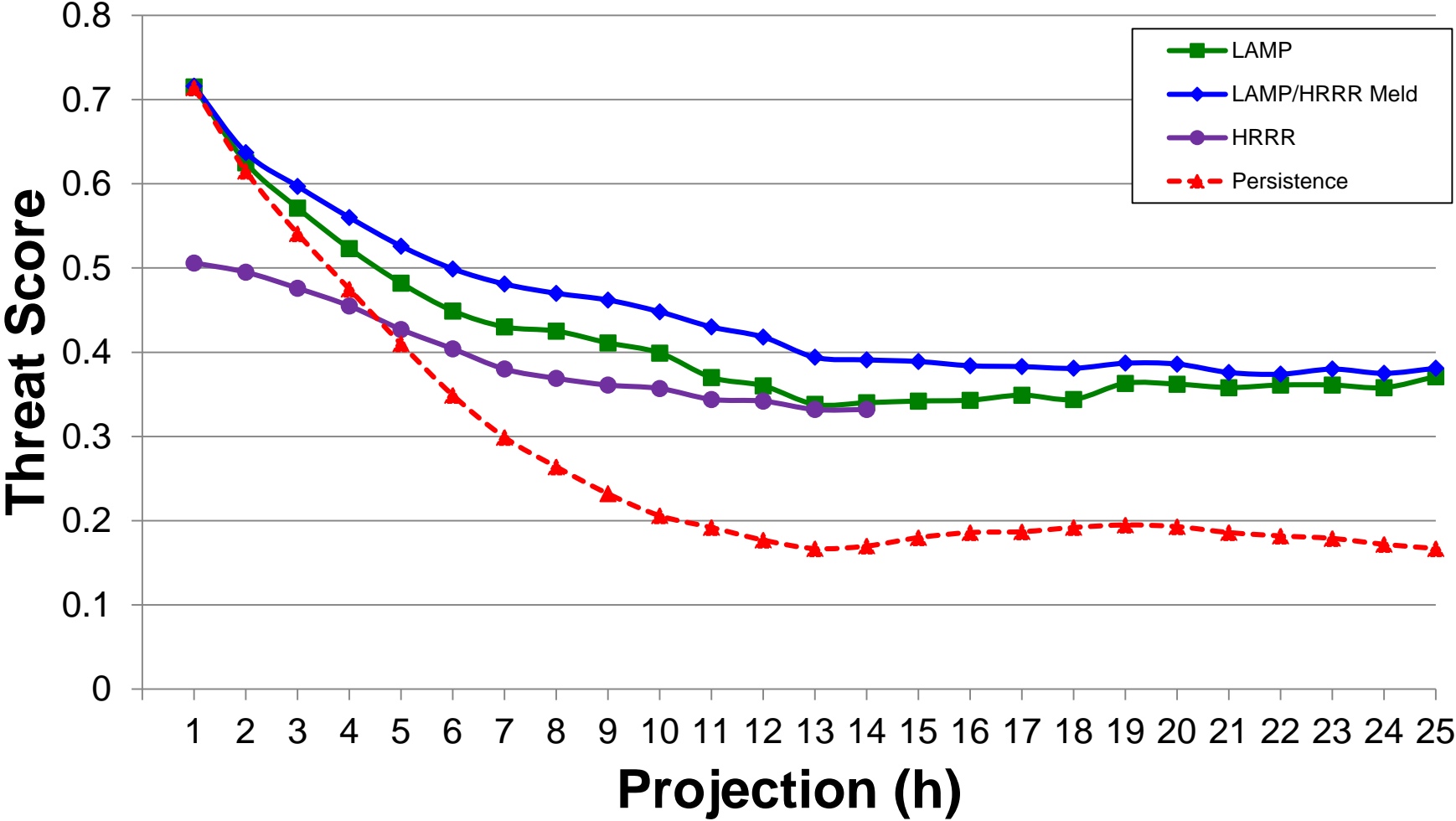
Threat Score: Ceiling < 1,000 FT
1200 UTC Cyle, Cool Season





Ceiling & Visibility: Threat Scores

Threat Score: Ceiling < 1,000 FT
1200 UTC Cycle, Cool Season





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Fall 2017 Implementation

- A. Adding 1-hr Convection and Lightning Guidance
- B. Adding stations to LAMP guidance to match MOS stations (per WFO requests)
- C. Using the most recent METAR observation and SPECI observations as input into LAMP (FAA AWRP funding)
- D. Running LAMP/GLMP every 15 minutes (FAA AWRP funding)

All of the above running on WCOSS in the Production Whitespace (Phase 1) for better availability for evaluation prior to handoff and implementation

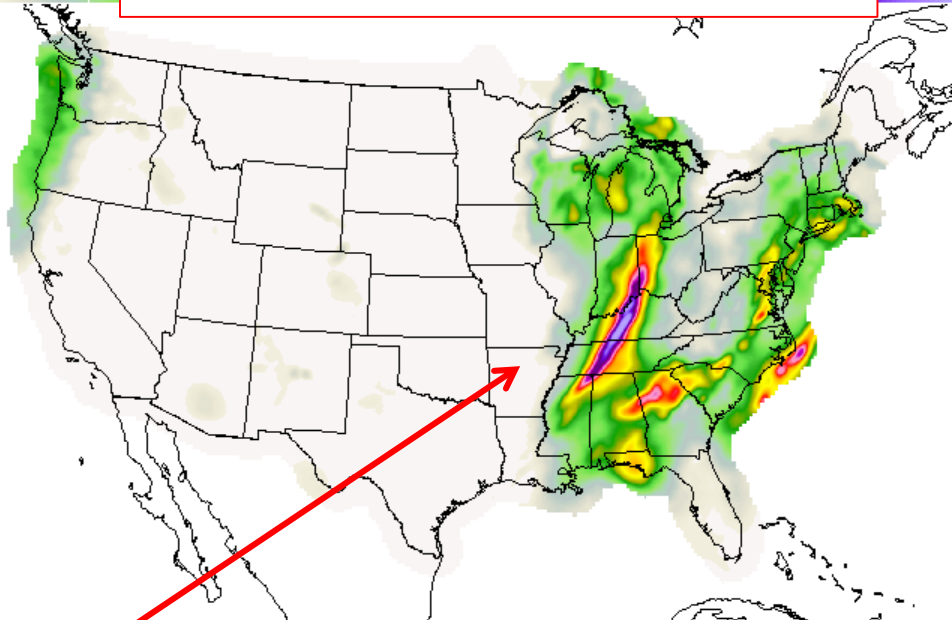
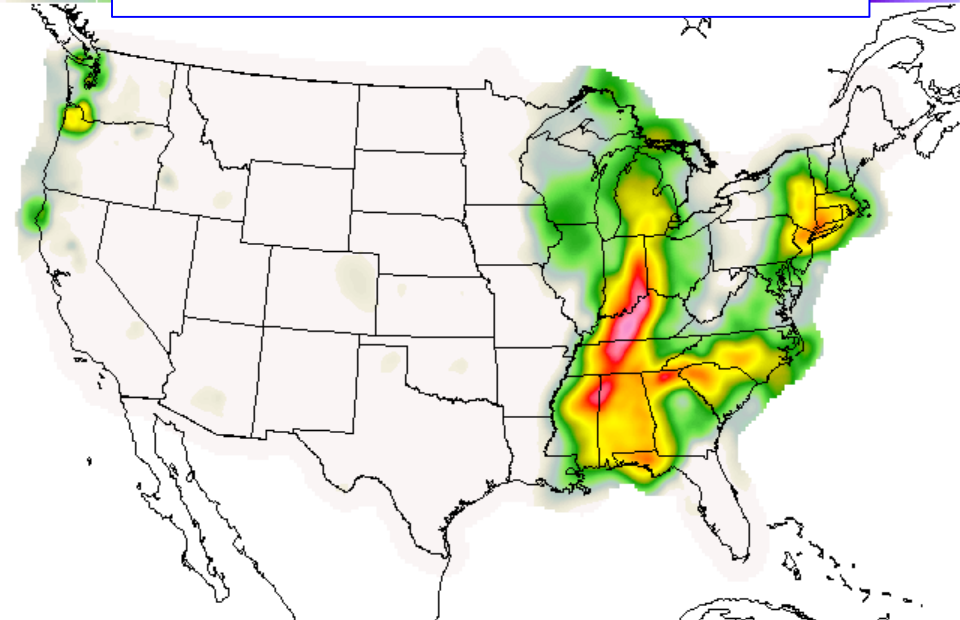
Fall 2017 Implementation

A. Adding 1-hr Convection and Lightning Guidance

8-h forecast from 18 UTC 12/23/2015

**Operational 2-hr product
Valid 00-02 UTC**

**Upgraded 1-hr product
Valid 01-02 UTC**



2-hr Convection Prob (%) ending Wed Dec 23 2015 9PM EST
(Thu Dec 24 2015 02Z)
Localized Aviation MOS Program
18z model run Graphic Created Dec 15 10:02AM EST

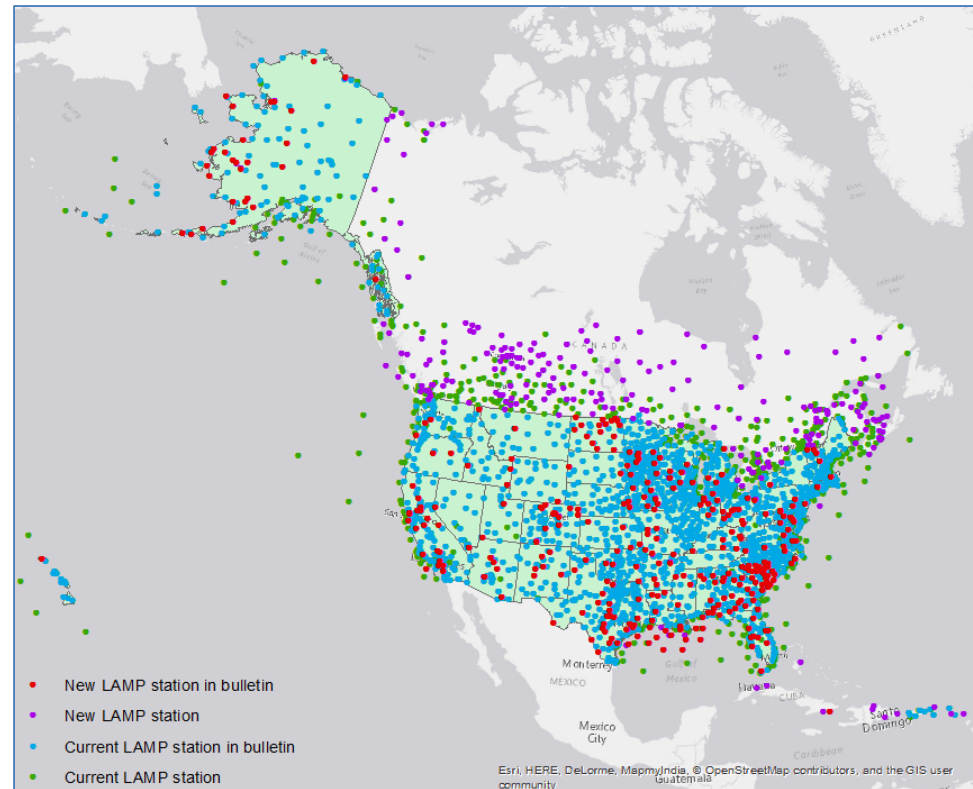
1-hr Convection Prob (%) ending Wed Dec 23 2015 9PM EST
(Thu Dec 24 2015 02Z)
Localized Aviation MOS Program
18z model run Graphic Created Dec 15 10:02AM EST

By incorporating HRRR data, MRMS data, and Total Lightning data, this upgrade results in better temporal (1-hr projections) and spatial resolution of convection and lightning guidance

Fall 2017 Implementation

B. Adding stations to LAMP guidance

- Adding 555 new stations for use in LAMP to already existing equations and thresholds
- 332 of those new stations will be added to the LAMP text Bulletins and BUFR
 - Adding these stations for ceiling, visibility, obstruction to vision, convection, and lightning guidance
 - Other elements will follow in time



- New stations will be added to GLMP as inputs in the next implementation (FY18)



Fall 2017 Implementation

C. Using the most recent METAR observation and SPECI observations as input into LAMP (FAA AWRP funding)

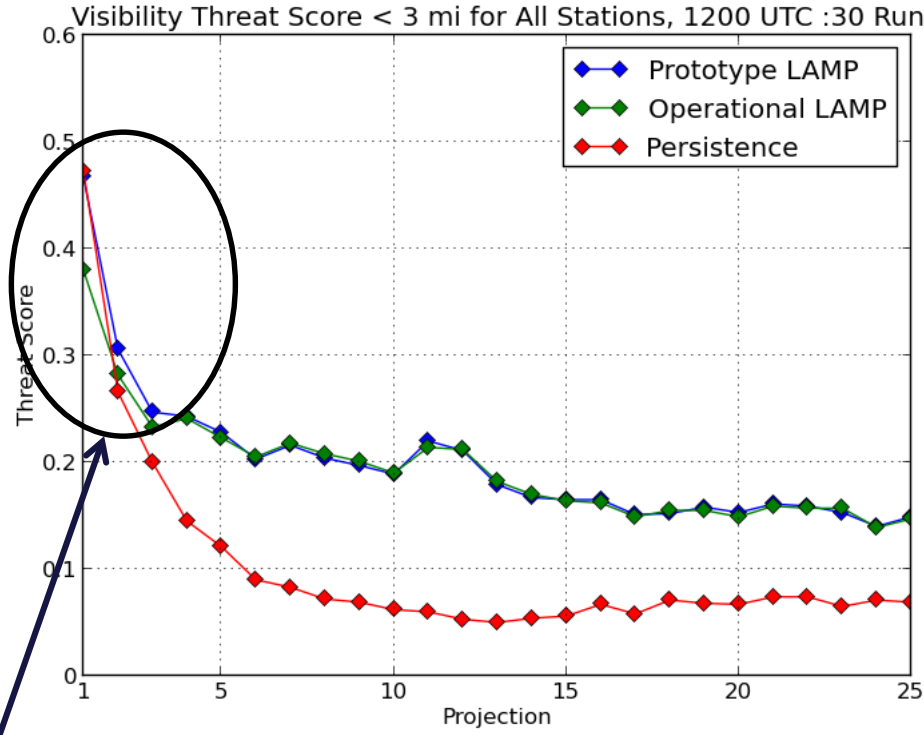
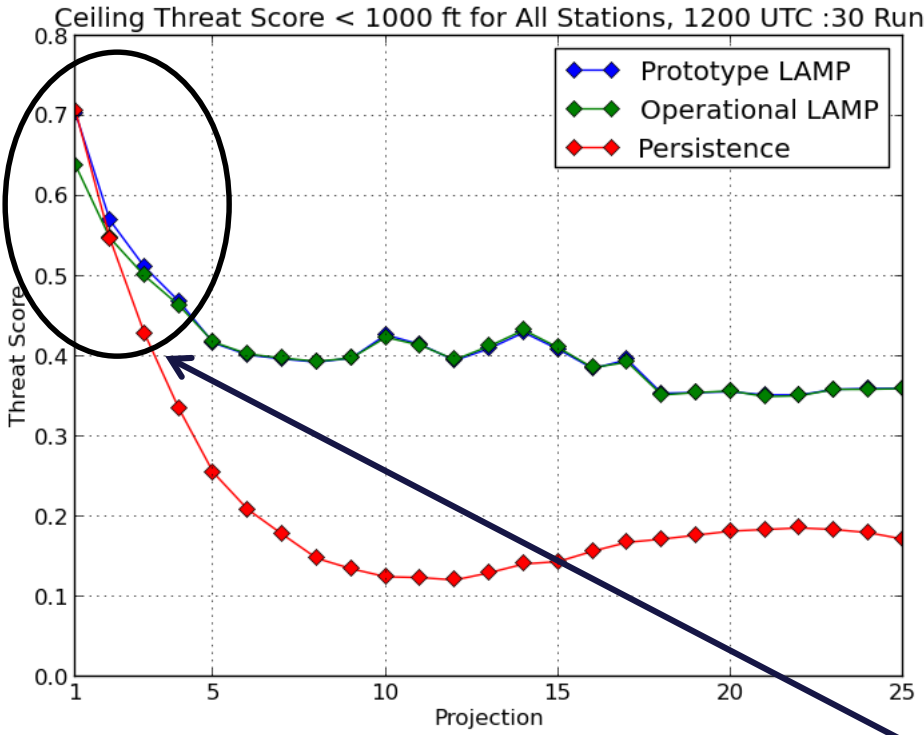
- Task Funded via the FAA AWRP for Ceiling and Visibility; MDL is working together with NWS AWC and NCEP/EMC
- Specific LAMP focus: improve the 0-3 hour Ceiling Height and Visibility forecast guidance by utilizing all available observations
- Historically, LAMP products have only used the “hourly” METAR observations taken at the “top of the hour”
 - The METAR report taken closest to the “top of the hour” were used, even if a more recent METAR observation was available
 - SPECI observations were not considered
- Upgrade: use most recent METAR or SPECI observation for all elements
- Benefits LAMP at stations and on the grid
- Preliminary results indicate there is a small improvement in the first few hours of the period for ceiling and visibility



Most Recent Observations



Verification: 1200 UTC, warm season, small sample



Base Run of LAMP using the **most recent observations** (blue line) shows improvement over **operational LAMP** (green line) in first few hours of forecast period.



Fall 2017 Implementation

D. Running LAMP/GLMP every 15 minutes (FAA AWRP funding):

- Updated LAMP guidance will be available for the NWS AWC's Helicopter Emergency Medical Services (HEMS) Tool
- Continue to run hourly 1-25 hours for all elements (Base run)
- In addition, run 3 extra times per hour for **ceiling and visibility** only, **going out 3 hours**
- Dissemination:
 - Available operationally to AWC for HEMS tool
 - Available experimentally on website for evaluation to determine if it should be added to SBN

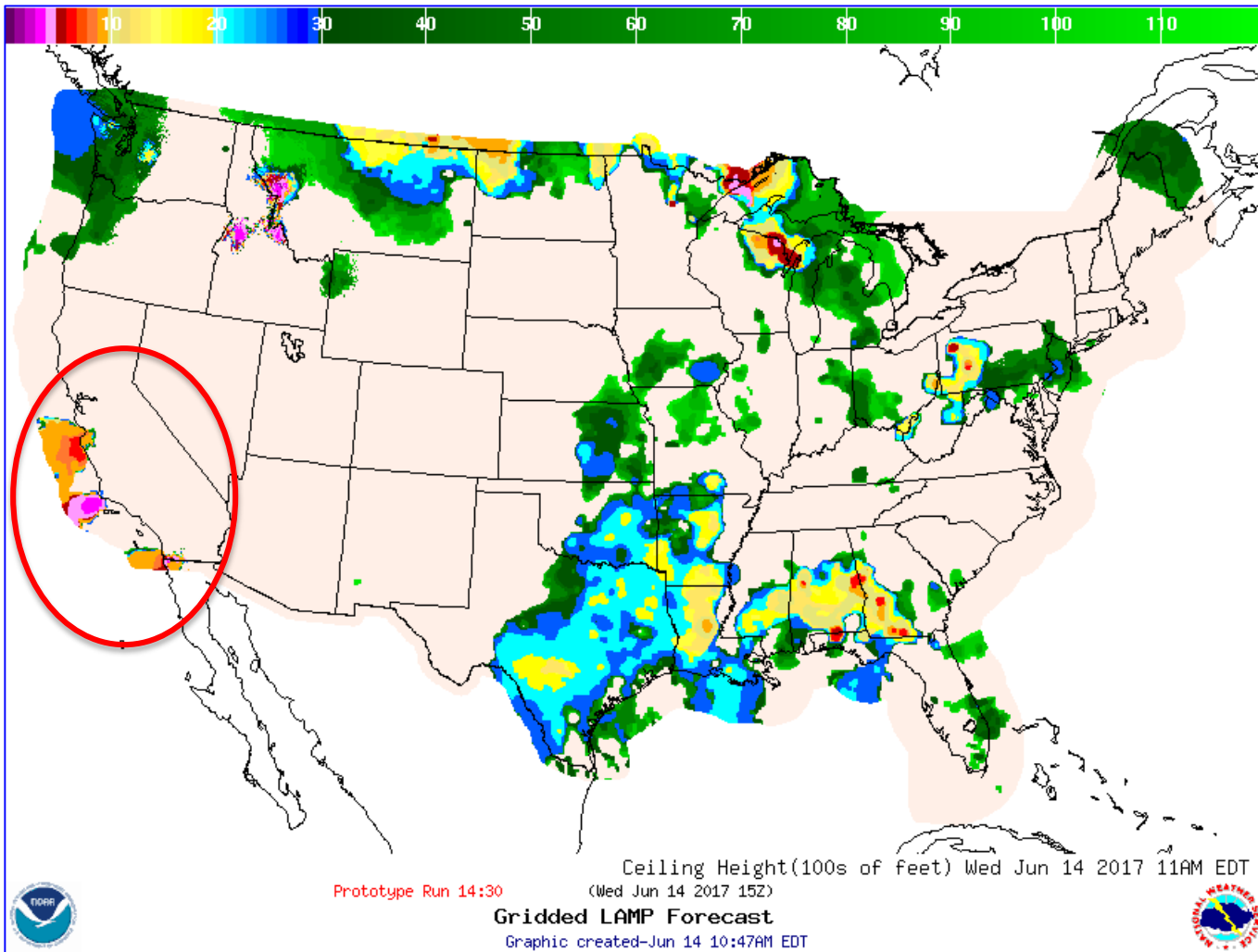
KLAX	GFS	LAMP	GUIDANCE	6/14/2017	2200 UTC
UTC	23	00	01		
CIG	8	8	8		
VIS	7	7	7		
OBV	N	N	N		

Example: Updated LAMP
Bulletin 2245 UTC



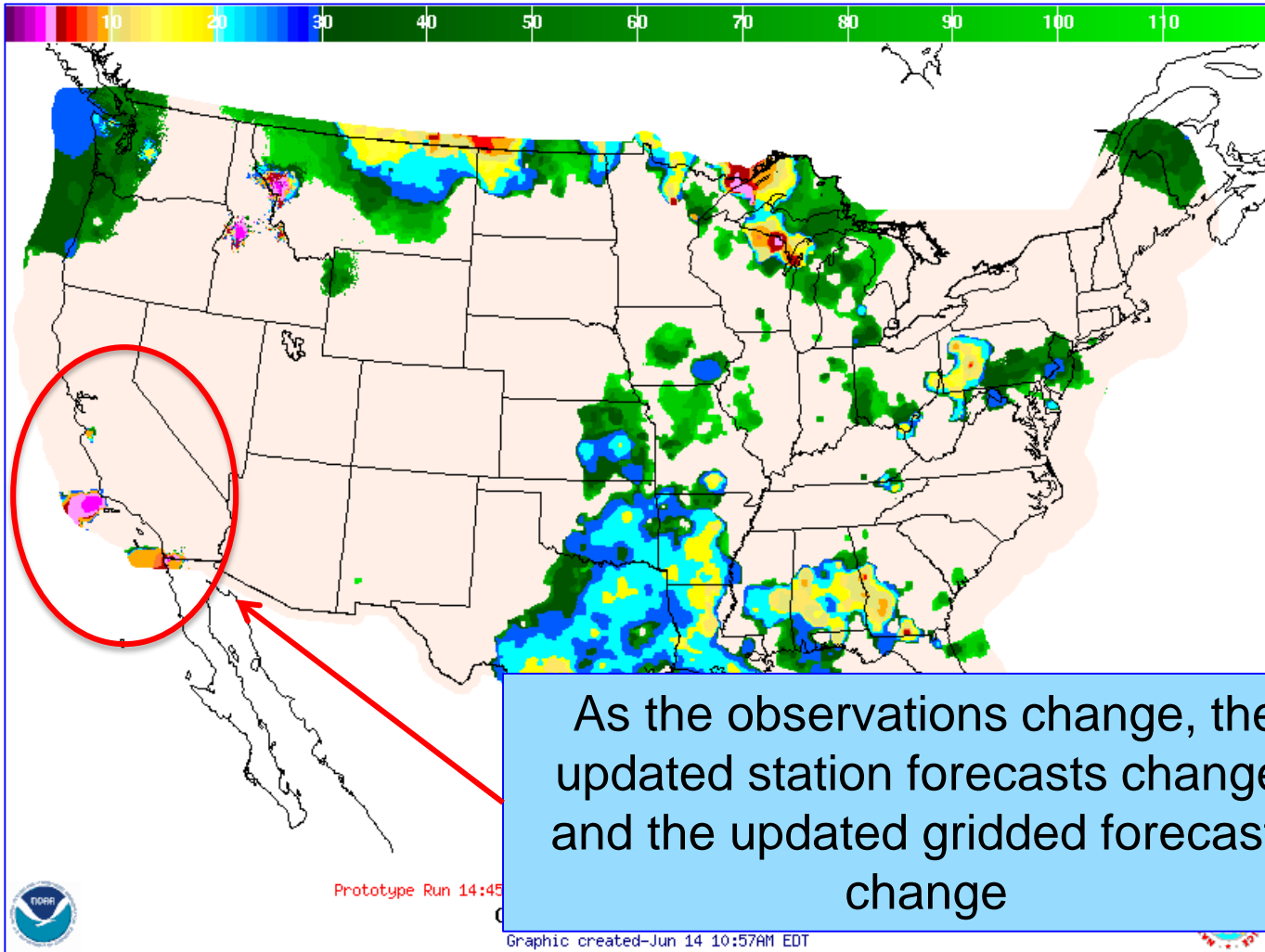
15-minute updates

15-Min GLMP Prototype 6/14/2017
1430z run valid at 15:00z



15-minute updates

15-Min GLMP Prototype 6/14/2017
1445z run valid at 15:00z





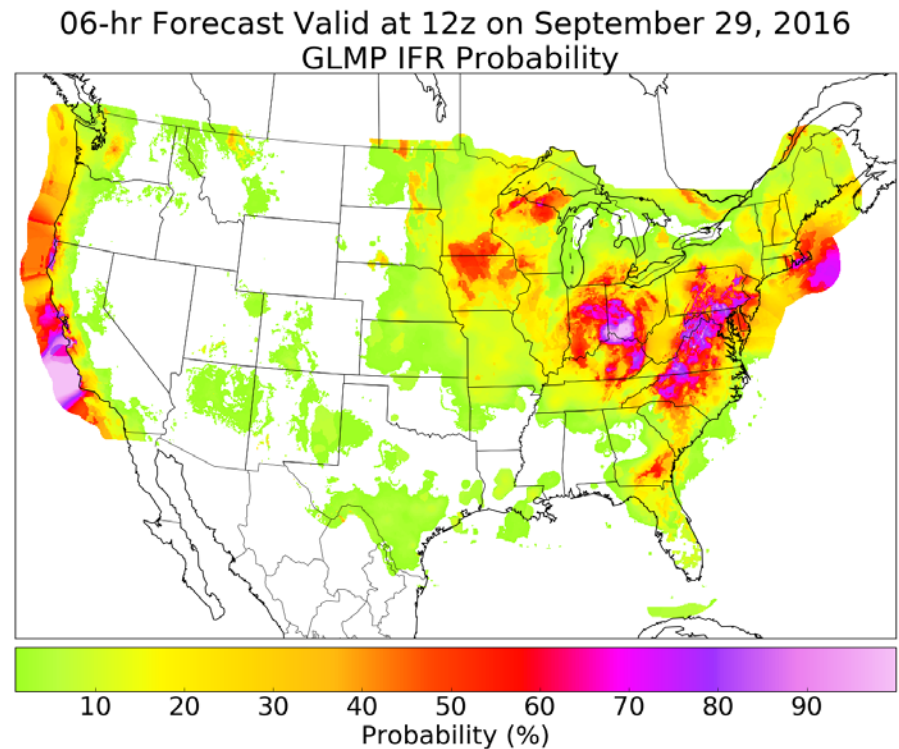
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Future work beyond 2017*

- Meld-like development for additional forecast elements for Gridded LAMP:
 - Gridded Cloud Base
 - Flight categories
- Redeveloping Ceiling and Visibility Guidance using:
 - Additional Stations
 - Updated GFS MOS input
 - Updated HRRR input
- Extending LAMP/GLMP to cover the 36-hour forecast period at least 4 times a day





Additional Resources



- LAMP website: http://weather.gov/mdl/lamp_home
- LAMP Experimental website:
http://www.weather.gov/mdl/lamp_experimental
- Contact: Judy.Ghirardelli@noaa.gov

Thank You!