

# Using Probabilistic Data for Strategic Traffic Flow Management

"How Humans Deal with Uncertainty"

---

July 21, 2014

John Huhn (*MITRE CAASD*)

Brian Campos (*FAA ATCSCC*)

# Short Range Ensemble (SREF) Forecast Utilization at the Air Traffic Control System Command Center (ATCSCC)

## ■ Introduction of SREF to ATCSCC:

- ✓ Prototyping weather translation and integration techniques for Nextgen
- ✓ SREF – one of the first mesoscale model systems to go from 3 to 1-hour output
- ✓ Hourly probabilistic forecast guidance out to 39 hours

## ■ Strategic Traffic Flow Management (TFM) Beyond 6 Hours:

- ✓ Slow paradigm shift towards longer range guidance
- ✓ SREF lag time causes trepidation, considered “old” by the time it’s utilized

## ■ Interpreting and Using Probabilistic Data:

- ✓ Why 50% probability for the SREF is not a “coin-flip” proposition
- ✓ Supplement for establishing flow management structure to the system
- ✓ Developing multiple strategic options to hedge against inherent forecast uncertainty

## ■ Looking Forward:

- ✓ Operators not solely focused on skill scores, an applied understanding of SREF has established its value
- ✓ Experience and subjective judgment remains heavily relied upon for TFM strategies

# Managing Uncertainty

---

## ■ Decision-Making Utility for TFM

- ✓ Determining risk ( % probability and location)
- ✓ Deciding how to set up the NAS to maintain system integrity
- ✓ Operator self-calibration (Becoming comfortable with probability)
- ✓ Handling Low probability / High risk scenarios
- ✓ Interaction with human forecasters at SCC

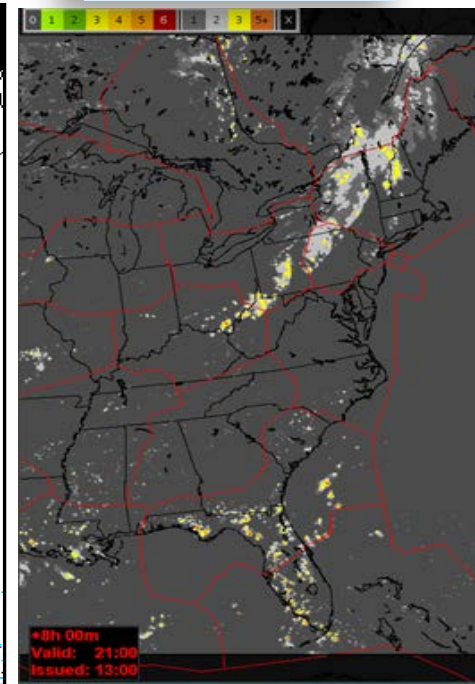
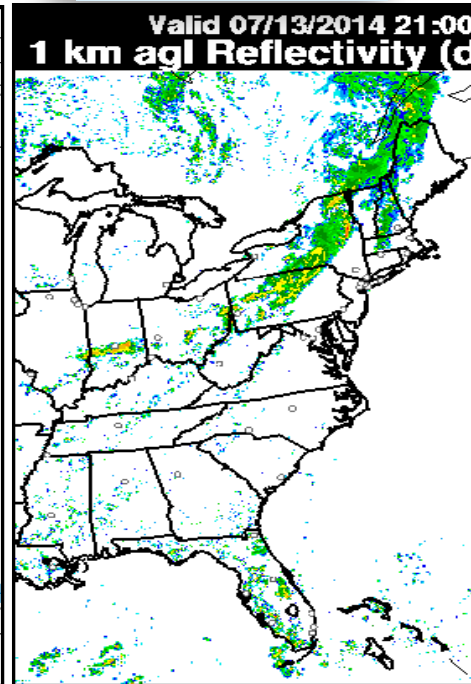
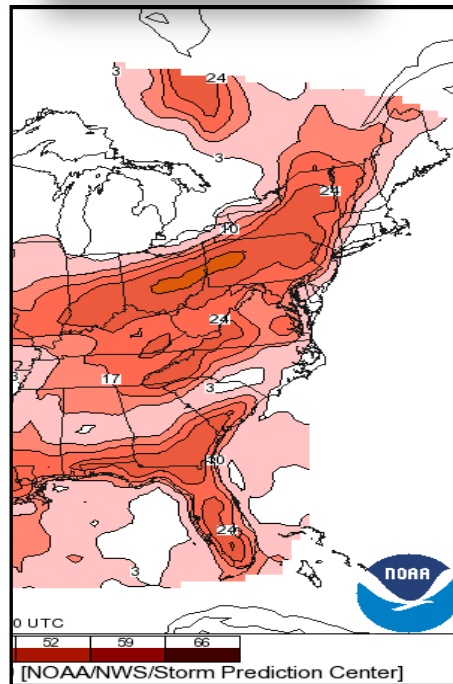
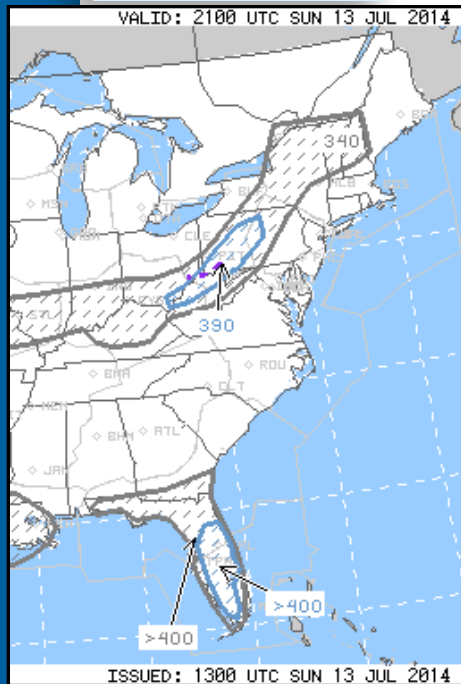
# Example: Forecast Guidance Utilized for TFM

**CCFP**  
(4hr-6hr-8hr)

**Hourly SREF**  
(00-39hrs)

**Hourly HRRR**  
(00-15hrs)

**CoSPA**  
(00-8hrs)



This is the copyright work of The MITRE Corporation and was produced for the U.S. Government under Contract Number DTFAWA-10-C-00080 and is subject to Federal Aviation Administration Acquisition Management System Clause 3.5-13, Rights in Data-General, Alt. III and Alt. IV (Oct. 1996). No other use other than that granted to the U.S. Government, or to those acting on behalf of the U.S. Government, under that Clause is authorized without the express written permission of The MITRE Corporation. For further information, please contact The MITRE Corporation, Contract Office, 7515 Colshire Drive, McLean, VA 22102, (703) 983-6000.

The contents of this material reflect the views of the author and/or the Director of the Center for Advanced Aviation System Development, and do not necessarily reflect the views of the Federal Aviation Administration (FAA) or Department of Transportation (DOT). Neither the FAA nor the DOT makes any warranty or guarantee, or promise, expressed or implied, concerning the content or accuracy of the views expressed herein.

©2014 The MITRE Corporation. The Government retains a nonexclusive, royalty-free right to publish or reproduce this document, or to allow others to do so, for "Government Purposes Only."