

# ATM/MET

## Status Update for the ICAO/WMO ASIA/PAC Seminar

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Date: January 2011



## Agenda

- On-going FAA and NWS efforts to TFM weather requirements
- Collaborative Decision Making (CDM) related work



## On-going Efforts

- Short-Term
  - Maintain current Center Weather Service Unit (CWSU) configuration in each Air Route Traffic Control Center
  - Implement incremental improvements and standard operations for 24/7 coverage and TRACON forecasts
    - Standardized CWSU TRACON Forecast for the ten TRACONS identified in the CWSU Requirements Document
      - Beginning with convective forecasts

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## On-going Efforts

- Joint FAA and NWS team established to:
  - Develop common outcome and strategies to achieve for all NWS aviation weather services in support of TFM
  - Establish functional and performance requirements
  - Establish operational performance measures and metrics for TFM requirements
  - Establish detailed implementation plans
- Team developed and has begun a work plan
  - Initial plan developed November 2010
  - Final plan September 2011; implementation begins October 2011

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## CDM Related Work-Collaborated Convective Forecast Product (CCFP)

- NWS leads collaboration between government and industry meteorologists every 2 hours
- 2, 4, 6 hour forecast of coverage (sparse, medium, solid) and confidence (low, high)
- “Poor-Man” version of Single Authoritative Source (SAS) envisioned for NextGen
  - Traffic Flow Managers use to develop playbook

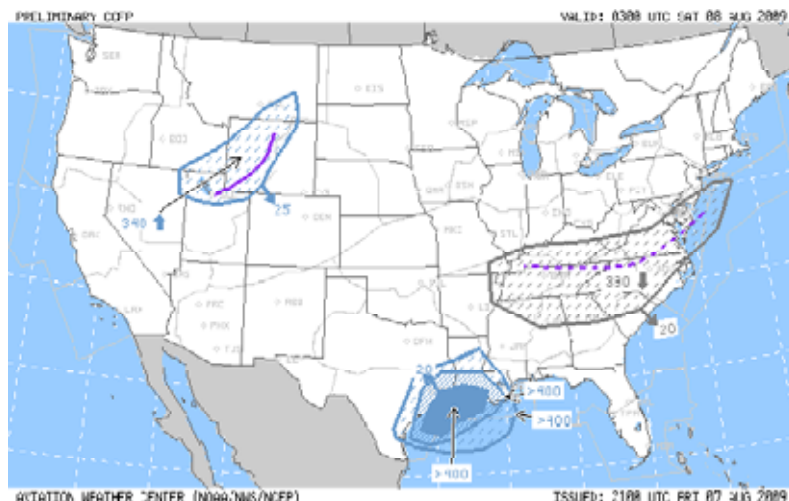
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## CCFP - Example



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## CDM Weather Evaluation Team

- **LAMP/CCFP Hybrid (LCH)**

- **The Acronym**

- L = LAMP = Localized Aviation Model Output Statistics (MOS) Program
    - C = CCFP = Collaborative Convective Forecast Product
    - H = Hybrid

- **The LAMP Product**

- Probabilistic Forecast out to 25 Hours
    - Produced Automatically using a Combined Approach
      - Physics Based Computer Model of the Atmosphere
      - Statistics ( "M" in LAMP = Model Output Statistics)
      - Observations (Lightning, Radar, etc.)
    - Forecast Graphic
      - Updated Every Hour
      - Coverage is CONUS

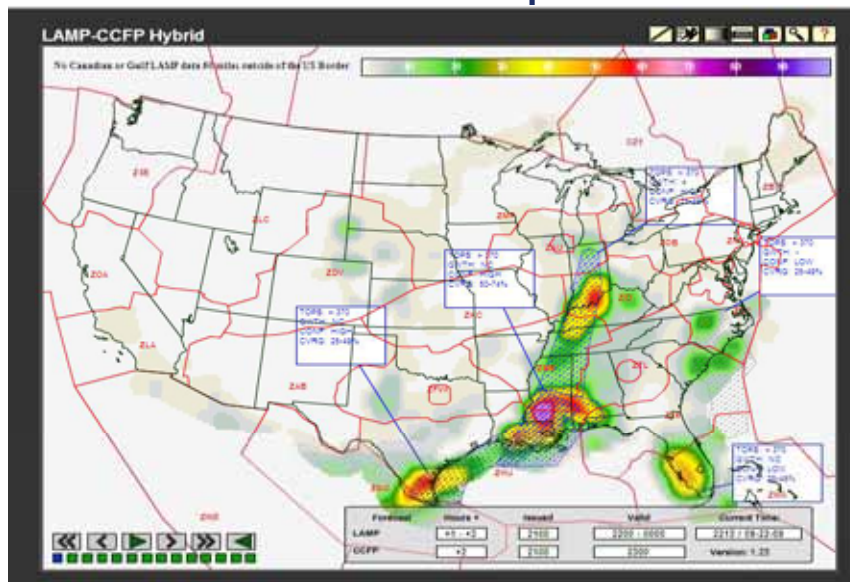
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## LCH Example



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## LCH-Status

- **2009 Demo Met Goal:**
  - 01Jun - 31Aug 2009: limited demonstration with CDM shareholders
  - Objective & Subjective assessments showed LCH met goal to improve confidence in the CCFP & extend the forecast time period
- **2010 Demo just ended:**
  - Coupled efforts with CoSPA to reduce impact on field personnel
    - Training & Assessments
  - Demo started June 1, 2010, just completed
  - Included Trend Analysis Feature
- **WET has recommended for 2011 to:**
  - Expand LCH demonstration to entire CDM community
  - Continue Couple efforts with CoSPA
  - Probabilistic attribute introduces a key NextGen theme that needs exploration with TFM decision maker

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## Consolidated Storm Prediction for Aviation (COSPA)

- **Provides forecast of precipitation intensity and echo tops from 0-8 hrs**
- **Blends high-resolution numerical weather model with Corridor Intergrated Weather System (CIWS) storm extrapolations**
- **Maintains identical look and feel of CIWS**
- **Gridded for future integration into FAA Air Traffic Management (ATM) Decision Support Tools (DST)**

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## CoSPA-2010

- **CoSPA Capability**
  - Covers Full CONUS 0-8 hr Forecast
  - CCFP Forecast Overlay
- **Operational Evaluation: June 1 – Sept 30, 2010**
  - Select FAA facilities & Airline Operation Centers evaluating CoSpa.
  - Investigating benefits & gathering user feedback
  - Coordinated with LCH demo
- **Quality Assessment Verification**
  - Data collection during summer for further analysis
  - Report due January 2011

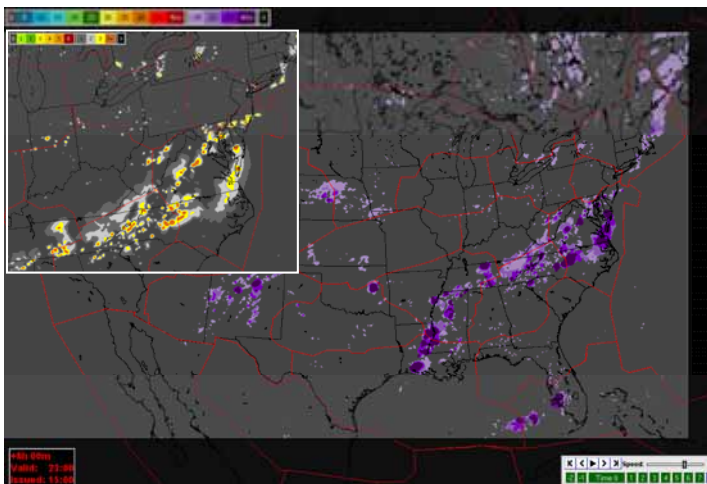
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## What is New: CoSPA Forecasts



- High resolution, deterministic 0 – 8 hr Precipitation and Echo Tops Forecast

- Animates in 15 min or 60 min increments

- Forecasts interpreted like radar – show “what radar will look like in the future”

- Updates every 15 min

- Improved forecast of storm organization & evolution

- Can be readily translated in to capacity impacts with current technology

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# CDM Weather Evaluation Team

- **Extended Planning Process**
  - WET helped coordinate startup of 2 products:
    - Extended Convective Forecast Product (ECFP)
    - Aviation Impact Guidance for Convective Wx (AIGCW)

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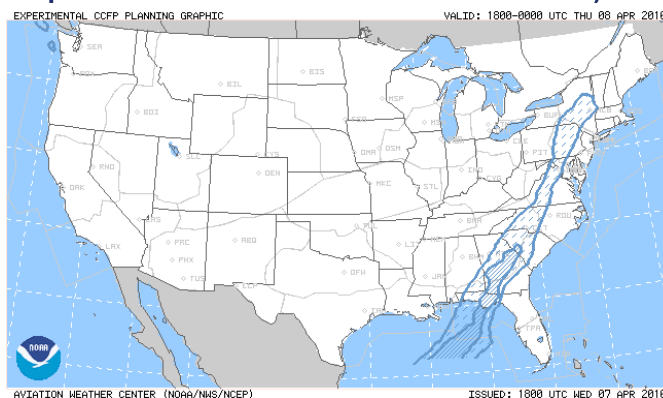
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# ECFP

## Extended Convective Forecast Product

(currently available for experimental use and evaluation on AWC web site)

- Contours drawn at 40, 60 and 80% probability of tstrm
- Hashed areas represent 40-59% probability
- Solid lined areas represent 60-79% probability
- Solid blue filled areas represent >80% probability.



- Updated by 1800Z each day and is valid for time period of 18-24Z the next day (Day 2)

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# AIGCW

## Aviation Impact Guidance for Convective Wx

(currently available for experimental use and evaluation on SPC web site)



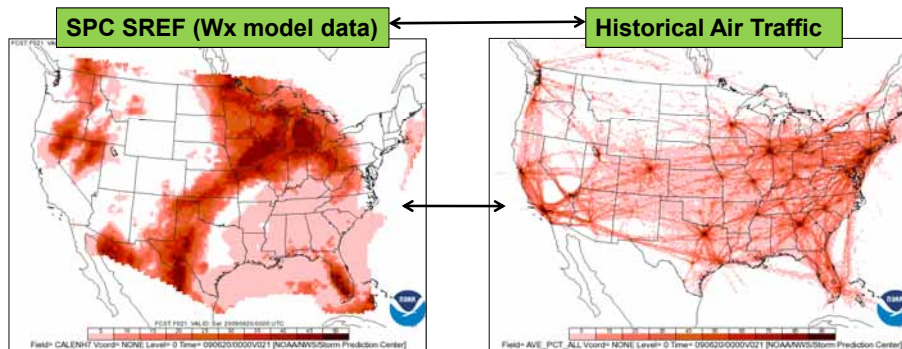
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## AIGCW: Wx Translation for TFM Long Range Strategic Planning



**Left:** Represents a sample output from SPC SREF forecast. It is presented as a gridded plot, interpolated from a 40 km output grid down to 20 km, to better align with the air traffic data.

**Right:** Illustrates air traffic in the NAS utilizing a 5-year sample set of historic air traffic data to produce an "air traffic composite". The data was gridded to construct various composites hourly for every day of the week (e.g., traffic positions on a Tuesday at 22 UTC).

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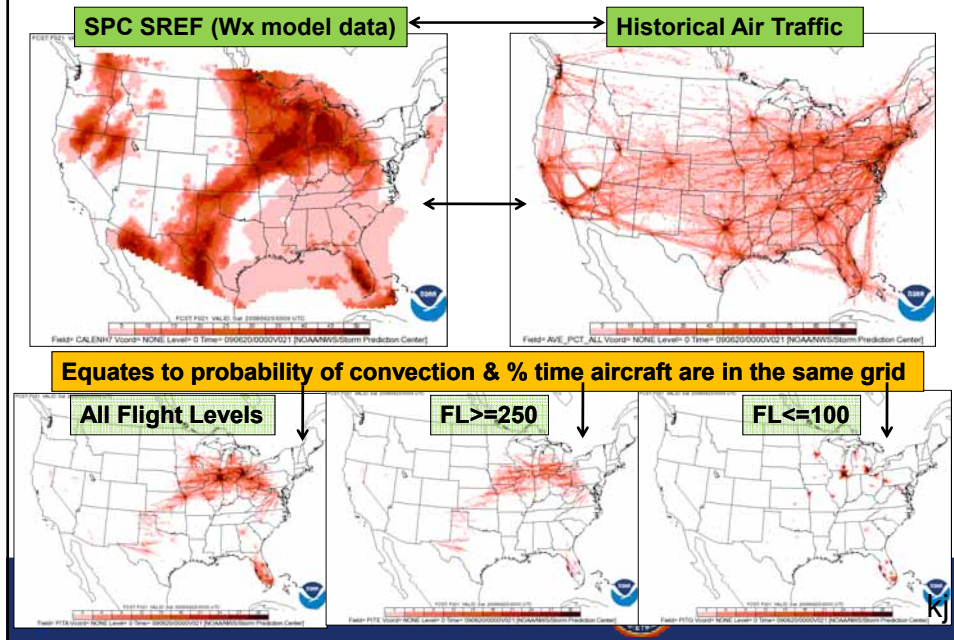


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## AIGCW: TFM Long Range Strategic Planning



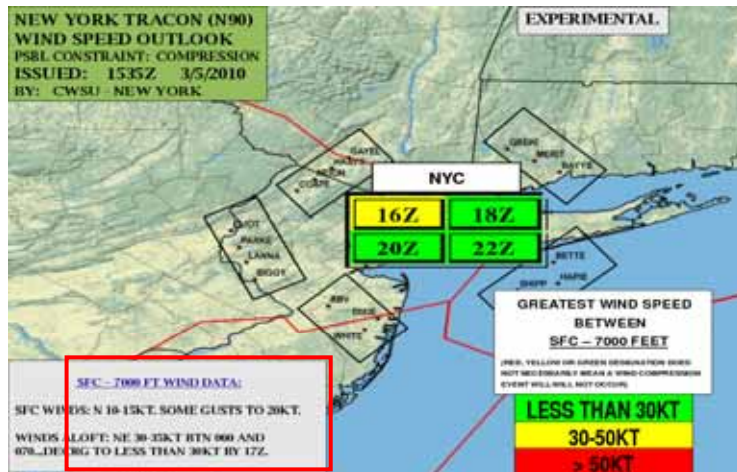
## Terminal/TRACON Winds

- **WET Coordinated with NWS on a Web Based Wind display (Part of new TRACON Forecast Product)**
  - Uses hourly Rapid Update Cycle (weather model) wind forecasts
  - Uses Colors to Highlight when winds forecast to exceed a threshold
  - Example on next slide of the "Wind Speed Outlook"
- **"Translation" of winds to impact**
  - MIT LL Path Based Shear product is being investigated for "forecast" component

# Wind Speed Outlook

## Possible Constraint: Terminal Area Compression

(currently available for experimental use and evaluation on ZNY CWSU web site)



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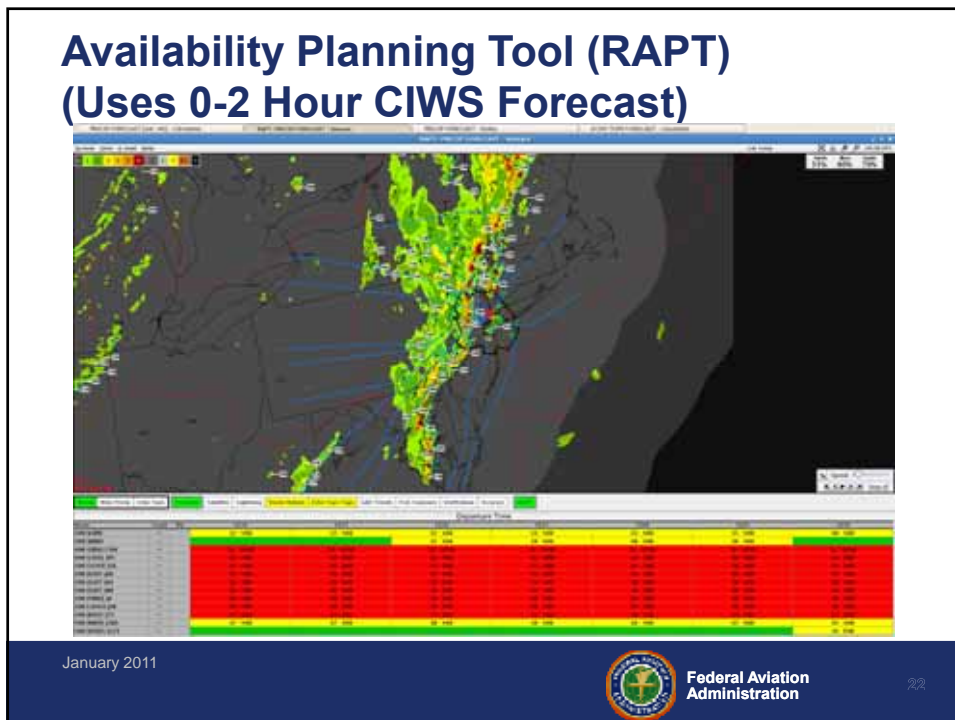
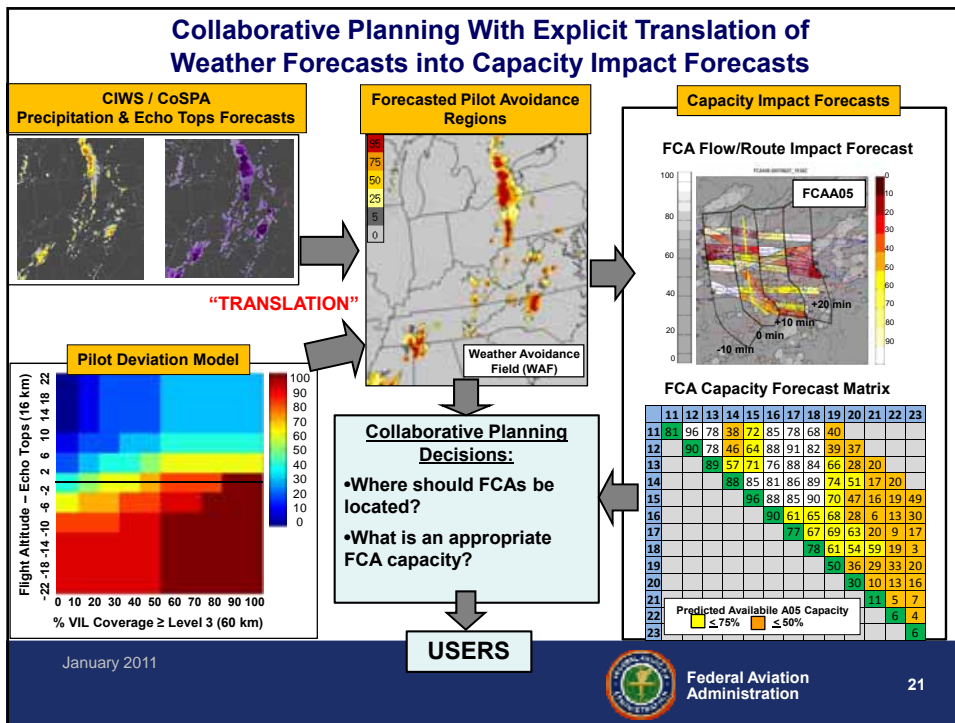
- **Weather Integration & Decision Support Tools**
  - Weather Avoidance Fields
  - Route Availability Planning Tool (RAPT)
  - Weather Impact Traffic Index (WITI)
- **Convection Forecasts and “Operational Bridging” between Strategic to Tactical domains**

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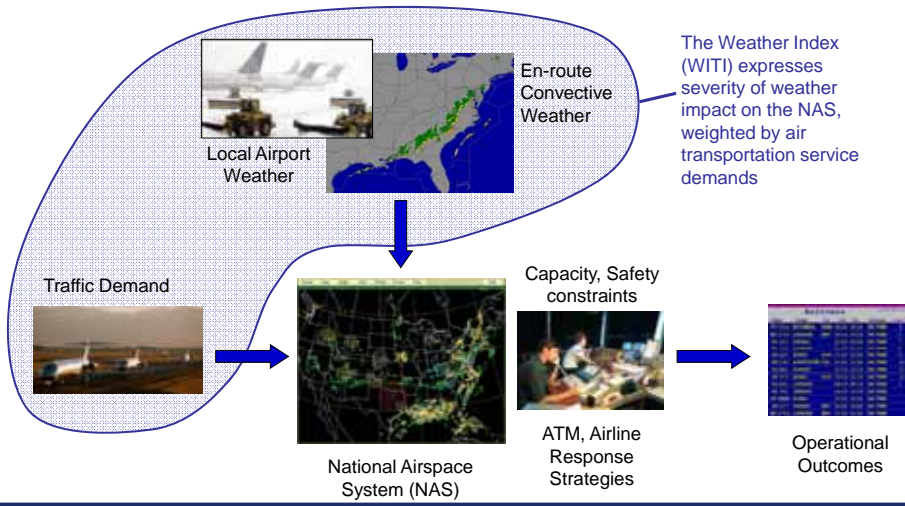
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## WITI - Measuring Weather / Traffic Impact

*"The Hand the NAS Is Dealt Every Day"*



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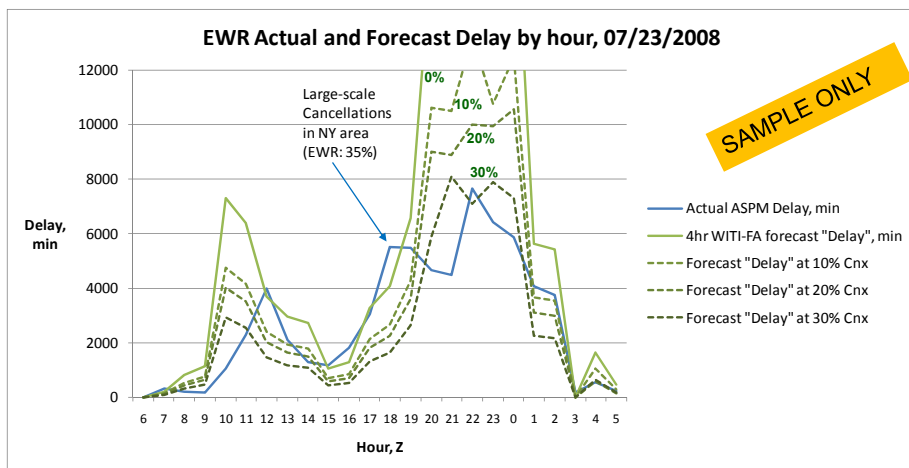


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## Potential Extension of WITI:

*Predict Required Level of Adjustments*

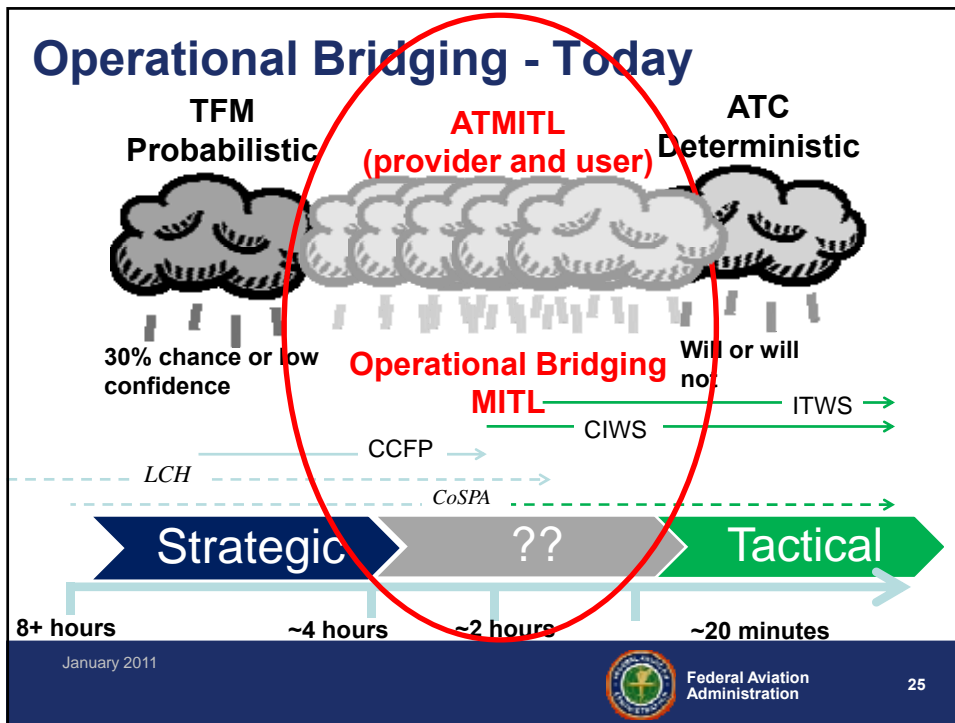


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## Key Questions for TFM and Weather Communities

- How will the CDM community be involved in content and governance of the future SAS?
- How will CDM execute “Operational Bridging” of weather forecasts that are automated and integrated into decision support tools and not verifying well?