NWS Research to Operations Success

August 2015 FPAW
• Blend of UKMET and GFS
• 3hr increments F06 to F36
• 1.25 degree downloadable grid available on WIFS
New Products:

- All diagnostics mapped to Eddy Dissipation Rate (EDR; m^{2/3}s^{-1})
  - ADDS to now display EDR values
- CAT diagnostic extended down to the surface and forecast hours 15 and 18
- New Mtn Wave diagnostic
  - CAT diagnostics combined with low level winds and terrain characteristics

New Platform

- Hosted on NCEP Central Operation’s (NCO) Weather and Climate Operational Supercomputing System (WCOSS)
  - Robust 24/7 support and reduced latency from direct model access

Operational Schedule

- Currently running in parallel on WCOSS in 30-day evaluation phase.
- Operational early October 2015
GTG Version 3

GTG2 - Maximum turbulence intensity (10000 ft. MSL to FL450)
Valid 1800 UTC Fri 21 Aug 2015. 2-hr forecast from 1800 UTC 21 Aug

GTG3 - Maximum combined intensity (100 ft. MSL to FL500)
02 hr forecast valid 1800 UTC Fri 21 Aug 2015

GTG - Maximum mountain wave (100 ft. MSL to FL500)
02 hr forecast valid 1800 UTC Fri 21 Aug 2015

GTG v2.5: 2-hr forecast valid 1800 UTC Fri 21 Aug 2015. Categorical display based on thresholds.

GTG v3.0: 2-hr forecast valid 1800 UTC Fri 21 Aug 2015. MTW forecast domains in units of EDR.

GTG v3.0: 2-hr forecast valid 1800 UTC Fri 21 Aug 2015. Combined (Max of CAT, MTW) in units of EDR.
National Guidance from AWC coupled with the evolution of CCFP into a Consistent Collaborative All Hazards Impact-based Decision Support Service, positions the NWS Aviation Program as a Weather Ready Nation Leader
Allow decision makers to more effectively manage Traffic Flow Management (TFM) initiatives

Scheduled convective forecast planning guidance to support Strategic Planning Call

Timely delivery of high-confidence, high-relevance aviation weather constraint forecasts

Enable more efficient use of available airspace
New TFM tools require more flexibility than CCFP provides e.g., Air Flow Programs, Ground Delay Programs, Collaborative Trajectory Options Program (CTOP)

Need more specificity about onset and cessation of weather events in high impact airspace

Focus limited resources in highest impact areas

Continuous collaboration captures dynamically changing NAS e.g., Runway Closures, Restricted Air Space, Playbook
User Advocacy

Enhanced avenue for collaboration

A solution to support more timely and effective ATM decisions,

Opportunity to exercise key NextGen concepts in the National Airspace System.
Transition from CCFP to CCFP Guidance and CAWS

PREVIOUS

- Collaborative Convective Forecast Product

Meteorologist In the Loop

DEMONSTRATION

CCFP Guidance

- CDM Convective Forecast Planning Guidance

Meteorologists Over the Loop

CAWS

- Collaborative Aviation Weather Statement

NEW
CAWS and CCFP Guidance

CAWS

- Event-driven collaborative forecast product
- Focus on weather events that can potentially impact strategic NAS planning
- Continual collaboration between the Government and Industry meteorologists
- Focus on key traffic flow and special use areas affecting the Core 29 terminals

CAWS improves upon CCFP

- Specific event timing (both onset and cessation)
- Description of Potential impact
- Orientation/Mode of Convection
- Eventual focus on all weather
  - Not just convection

CCFP Guidance

- Objectively generated convective forecast
  - High resolution meso- and storm-scale probabilistic guidance
- Support the every 2-hour scheduled Strategic Planning Call
- CAWS takes precedence when differences between CCFP, CoSPA, etc.
Initial Aviation Weather Statement Needs for an TFM Area of Concern*

- Onset: Thunderstorm activity is expected within 4 hours
- Cessation: Thunderstorm activity expected to end within 4 hours
- Consistency: Conflicting thunderstorm forecasts
- New Information: Thunderstorm activity is expected to cease earlier

*An area of concern includes en route traffic flows, Core 30 terminal operations and special event airspace.
Convective Allowing Models

- SREF
- Hi Resolution ARW
- 3 Time Lagged Versions of HRRR
Leverages SREF, HRRR, and HIRES ARW

Reintroduction of 2-Hr Forecast

24x7 versus 20x7

Issued 45 minutes versus 15 minutes before Strategic Planning Call
CAWS Example

Aviation Weather Statement 0003
NWS Aviation Weather Center Kansas City MO
1925 UTC Tue 12 Aug 2014

Valid Period...1925 UTC - 2300 UTC 12 Aug

AWS for Convection...

NAS Elements Affected...
ARTCCs...ZDC ZID ZOB
TRACONs...
Terminals...
Jet Routes...J64, J60, J80

Constraints...
A broken line of convection with tops FL300-450 continues moving through OH/PA. Convective threat will likely continue past 23z.
3rd Party Independent Verification

• Funded by FAA Aviation Weather Research Program
• Performed by NOAA ESRL/GSD
  • Same group that verified CCFP for a decade
  • Using proven methodologies

Data: March 2014 throughout Experimental period

• 1 full convective season, plus additional validation through the Winter

Direct comparisons with 2014 CCFP
Both the FAA (especially AJV-73, ANG-C6, and AJR-12) and airlines have made significant investments into the AWS since 2009.

Demonstrations of the AWS have occurred since 2011 at the Aviation Weather Textbed.

FAA and Airlines have endorsed the AWS and developed a phased implementation strategy.
CAWS/CCFP Example 1 08/20/2015

1113Z CAWS Valid Through 17Z

11Z CCFP Valid 17Z
11Z CCFP, Valid 17Z vs Observed Echo Tops

General Areas Right
Timing and Character Off
CAWS/CCFP Example 2 08/20/2015

2056Z CAWS Valid Through 01Z

21Z CCFP Valid 01Z
21Z CCFP, Valid 01Z vs Observed Echo Tops

General Areas Right
Timing and Character Off
Poorly Forecast WX = High Number of Diversions
Well Forecast WX = High Number of Delays

- Over 10,300 delays
- Top 10 Day This Year for Delays
- Only 138 Diversions