Cross-cutting Issues Impacting Operational ATM and Cockpit Usability of Aviation Weather Technology

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Introduction

- Air Traffic Management Coordinators are supposed to provide input into the development of Tactical Decision Aids that address hazardous weather
- However, how accurate, reliable, formalized, and **USABLE** is weather?
- Is flight crew part of the DST process? Pilots certainly have a stake in the outcome!

Operational Involvement

- From this observer, involvement of AT Managers, Supervisors, and Coordinators is “too informal and anecdotal”, rather than in-depth participation to set operational user requirements
- “If it doesn’t meet my needs as a user, forget it.”
- This short session must raise awareness of major deficits in NextGen DST’s for ATM and pilot
- Have the users had the opportunity to train providers regarding their needs?
- Additionally, is terminology obscuring the broad reach of the development process?

Aviation Weather Training Issues

ATC and Meteorologists

Background

--- Currently Detailed to FAA HQ, AJP- 6 Research and Technology Development

--- Permanent Position is Supervisor, Traffic Management Coordinator at Jacksonville En Route Air Traffic Control Center

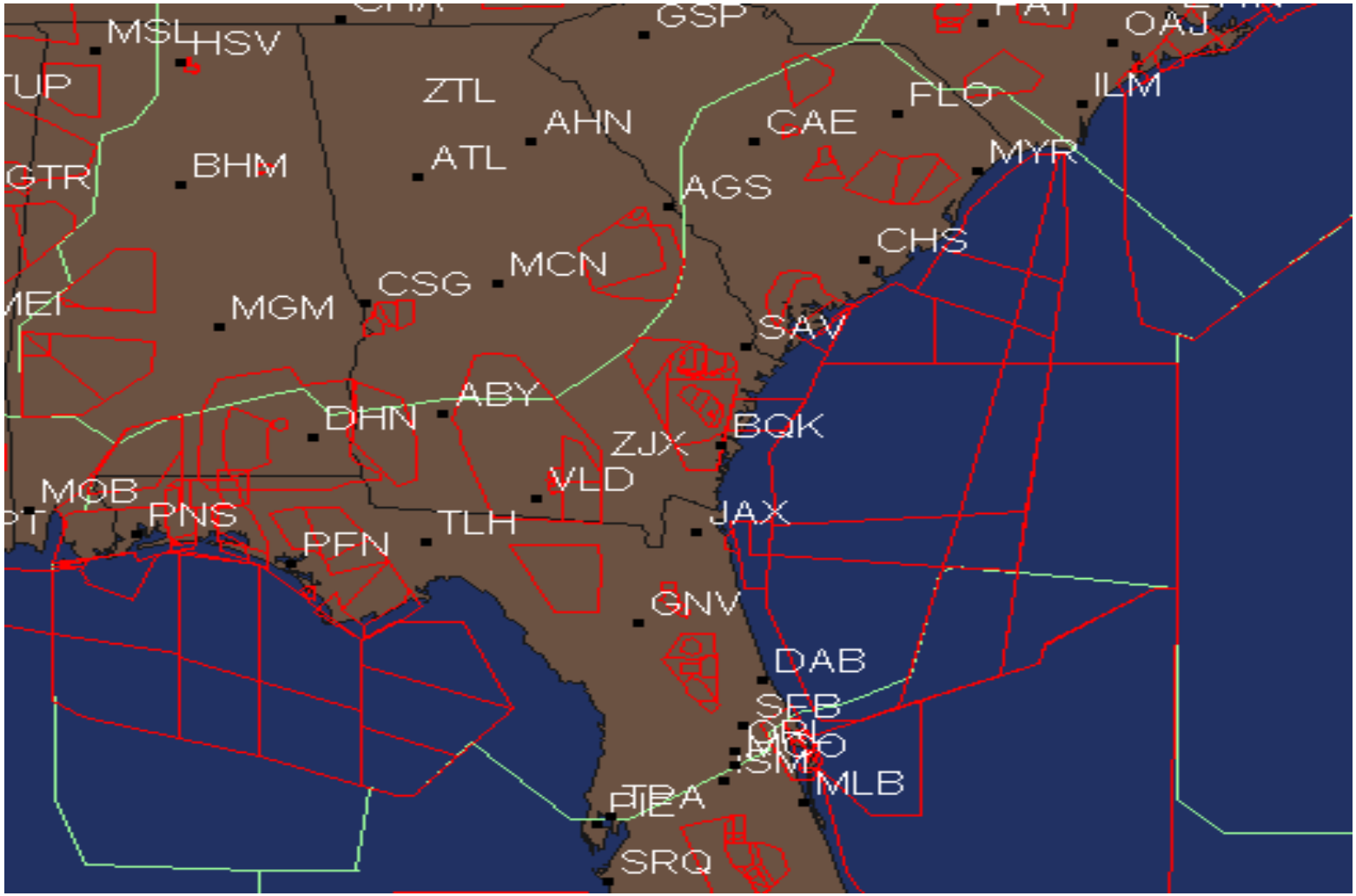
--- Staff of 4-6 Traffic Management Coordinators.

Area of Responsibility

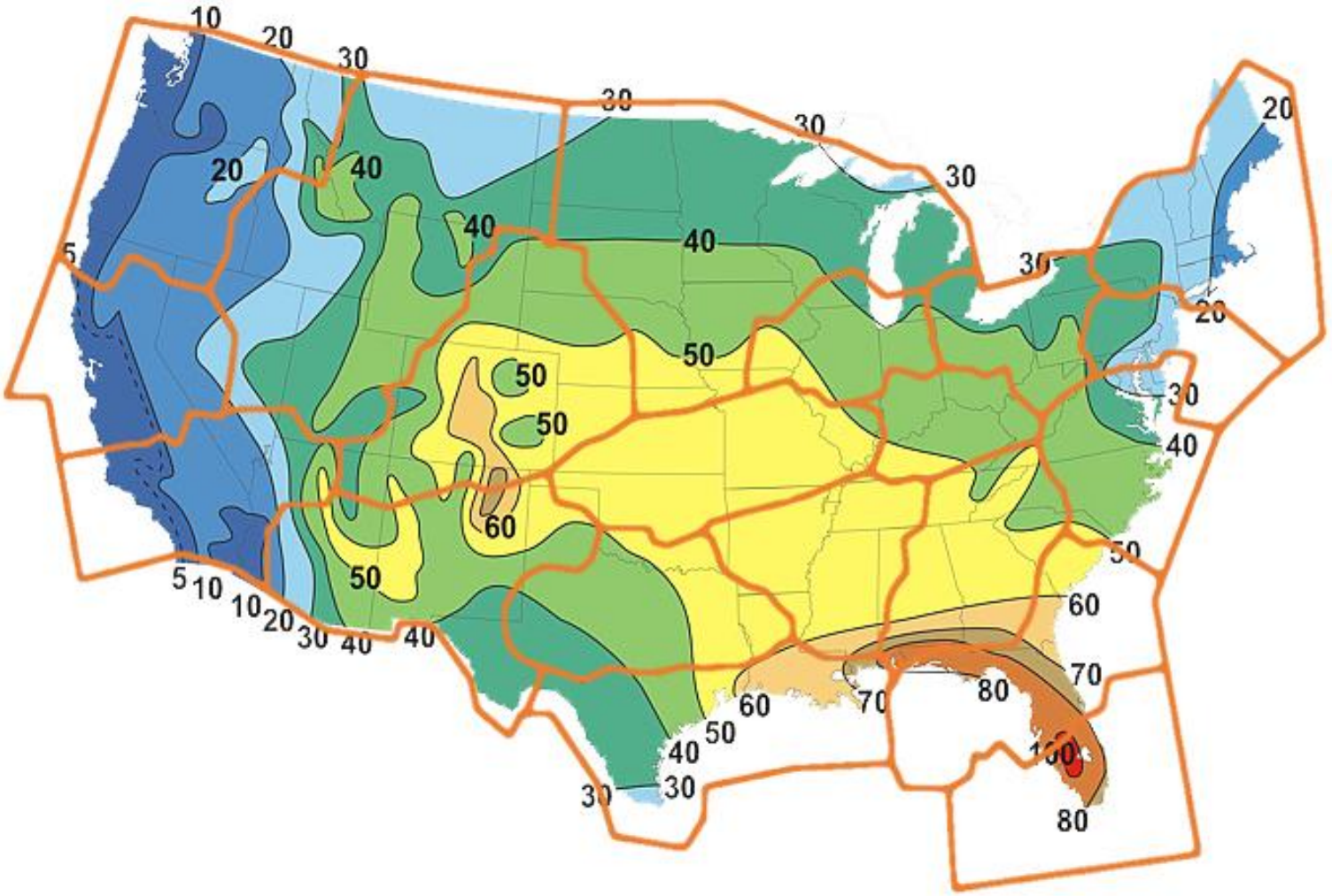
- To ensure a safe, orderly and expeditious flow of traffic through ZJX and underlying facilities by managing volume with Traffic Management Initiatives.

- Analyze, develop, coordinate, communicate, monitor and adjust a plan to manage constraints within ZJX.

ZJX – Jacksonville ARTCC

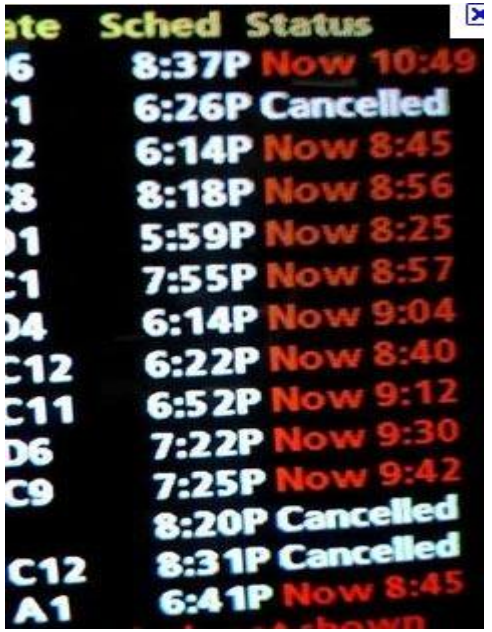


ARTCC Boundaries - Convection



How do we meet NextGen Goal?

- Reducing delays caused by weather by 14% in the midterm.
- Why is ZJX effective at managing weather constraints?



FACTS

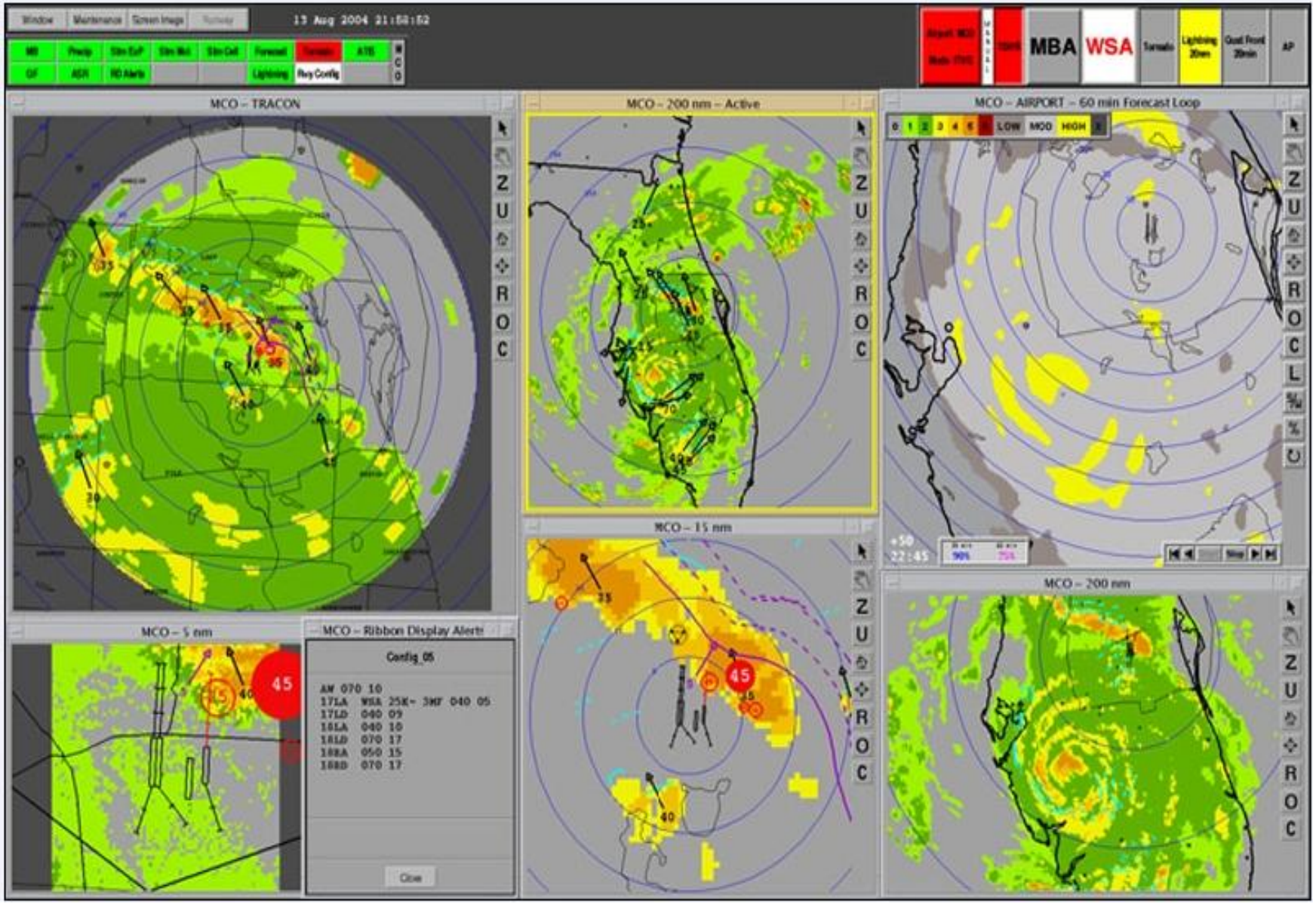
- Air Traffic controllers, Traffic Managers, Supervisors are **NOT** meteorologists yet make strategic and tactical decisions for the movement of aircraft through the NAS based on the display of various weather products.

- Meteorologists are **NOT** Air Traffic Controllers yet provide guidance on movement of aircraft around weather in the NAS.

Issues

- Current weather training is generic
- Weather display training focuses on “buttonolgy”
- No specialized training for ATC decision makers focused on interpreting the weather information available.

Delays due to Weather


13 Aug 2004 21:58:52
MBA
WSA
MCO – TRACON
MCO – 200 nm – Active
MCO – AIRPORT – 60 min Forecast Loop
LOW
MOD
HIGH
MCO – 15 nm
MCO – 5 nm
MCO – 200 nm
MCO – Ribbon Display Alerts
Config_05
AM 070 10
17LA WSA 25K+ 3NF 040 05
17LD 040 09
18LA 040 10
18LD 070 17
18RA 050 15
18RD 070 17
Close

ATC Weather Tools &Training

- Tools should present data in ATC terms
  - Decode terms and symbols
- Tailor training to geographic area
- Face-to-Face by Meteorologist vs. CBT
- Translations of “colors” to flight conditions
- Include ATC and pilots the development
  - Spend time in our environment
- Consider impact on airframe; small, large, heavy

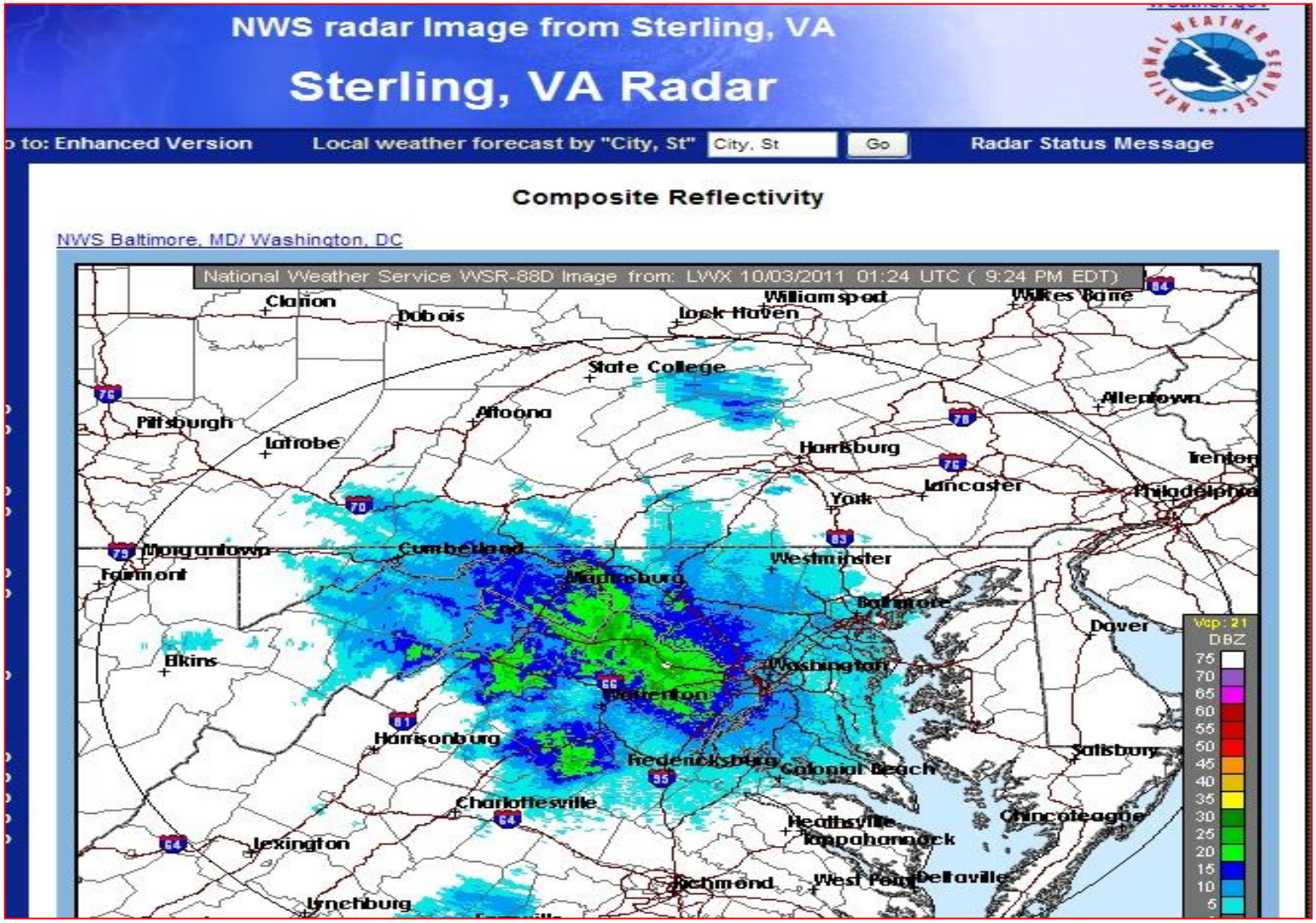
ATC Training

- How to find the “soft spot” in a line
- Where the weather permeable
- Extent of deviations on the routes
- Importance of pilot reports to validate decisions

Issues

- CWSU need specialized “aviation” training to for better integration into our Traffic Management Units.

Example of scale in DBZ



Looks like a bad weather day

ATCSCC OIS SYSTEM ADTN

7/19/2011

OIS Main Menu

- ⊞ Summary
- ⊞ Contingency Plan
- Planned Outages
- System Impact Report
- Int'l Summary
- ⊞ East Directory
- ⊞ West Directory

(Note: This page will refresh every minute. Last updated Tue, 19 Jul 2011 20:42:03 UTC.)

NATIONAL PROGRAMS

CONTROL ELEMENT	START	END	SCOPE	REASON	AVG	AAR	PR	ADVZY	DA
EWR	1943	0259	(Distance) - 1400 miles. + CYHZ+CYOW+CYUL+CYYZ+CYTZ+CYQB	WEATHER / THUNDERSTORMS	55	36	36	077	DA

GROUND STOPS

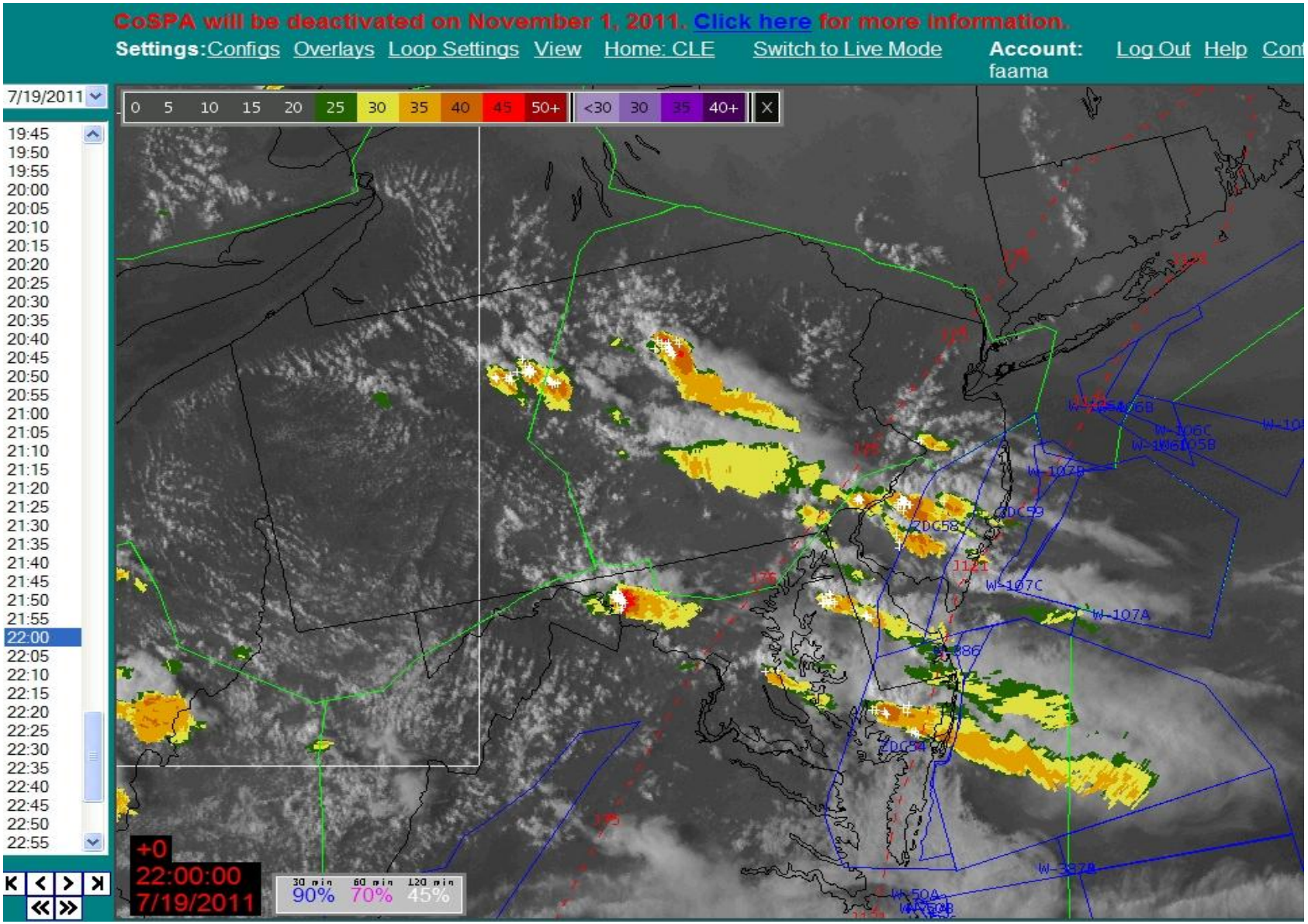
ARPT	UPDATE	POE	SCOPE	REASON	ADVZY
BWI	2045	MED	ZTL ZID ZJX ZBW ZOB ZDC ZNY	WEATHER / THUNDERSTORMS	074
LGA	2130	MED	ZTL ZMA ZJX ZDC	WEATHER / THUNDERSTORMS	083
PHL	2130	MED	ZTL ZMA ZJX ZDC	WEATHER / THUNDERSTORMS	084

DELAY INFO

ARPT	AD	DD	TIME	REASON
BWI		+90	2005	WX:Thunderstorms
CLT		+15	2038	TM Initiatives:STOP:WX
EWR		+45	2027	TM Initiatives:SWAP:WX
JFK		+45	2032	TM Initiatives:SWAP:WX
LGA		+75	2025	TM Initiatives:SWAP:WX
PHL		+30	2010	TM Initiatives:SWAP:WX
TEB		+75	2020	TM Initiatives:SWAP:WX

VACAPES REQUESTS

AREA	REQ/APVL	ALTITUDE	TIME	REMARKS
A - B - C	ON REQ	AOA FL240	1900-0400	

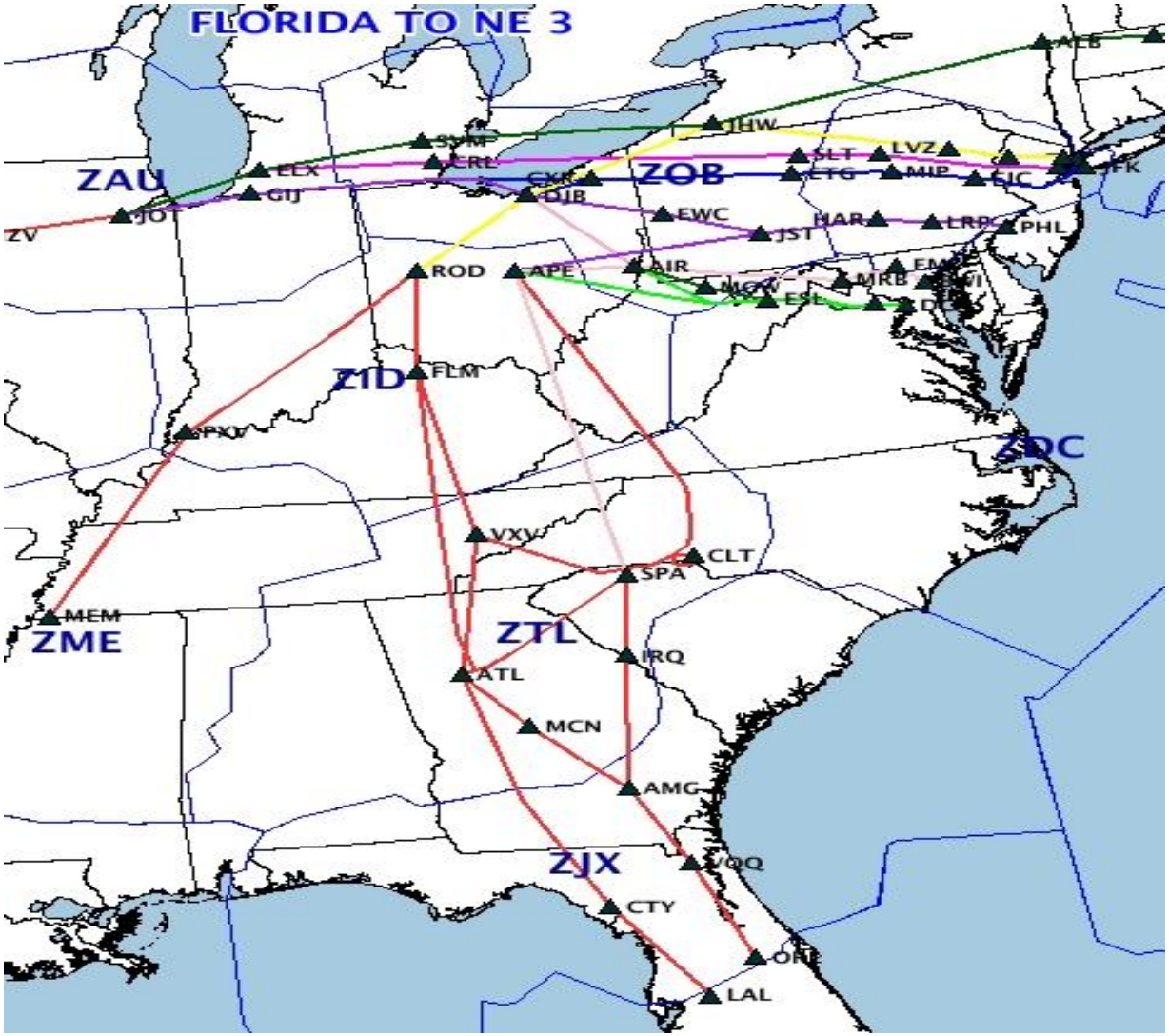

CoSPA will be deactivated on November 1, 2011. Click here for more information.
Settings: Configs Overlays Loop Settings View Home: CLE Switch to Live Mode
Account: faama
Log Out Help
7/19/2011
0 5 10 15 20 25 30 35 40 45 50+
<30 30 35 40+
19:45 19:50 19:55 20:00 20:05 20:10 20:15 20:20 20:25 20:30 20:35 20:40 20:45 20:50 20:55 21:00 21:05 21:10 21:15 21:20 21:25 21:30 21:35 21:40 21:45 21:50 21:55 22:00 22:05 22:10 22:15 22:20 22:25 22:30 22:35 22:40 22:45 22:50 22:55
+0
22:00:00
7/19/2011
30 min 60 min 120 min
90% 70% 45%
ZDC58
ZDC53
ZDC54
J121
W-107C
W-107A
W-107B
W-106C
W-106B
W-387B
W-50A

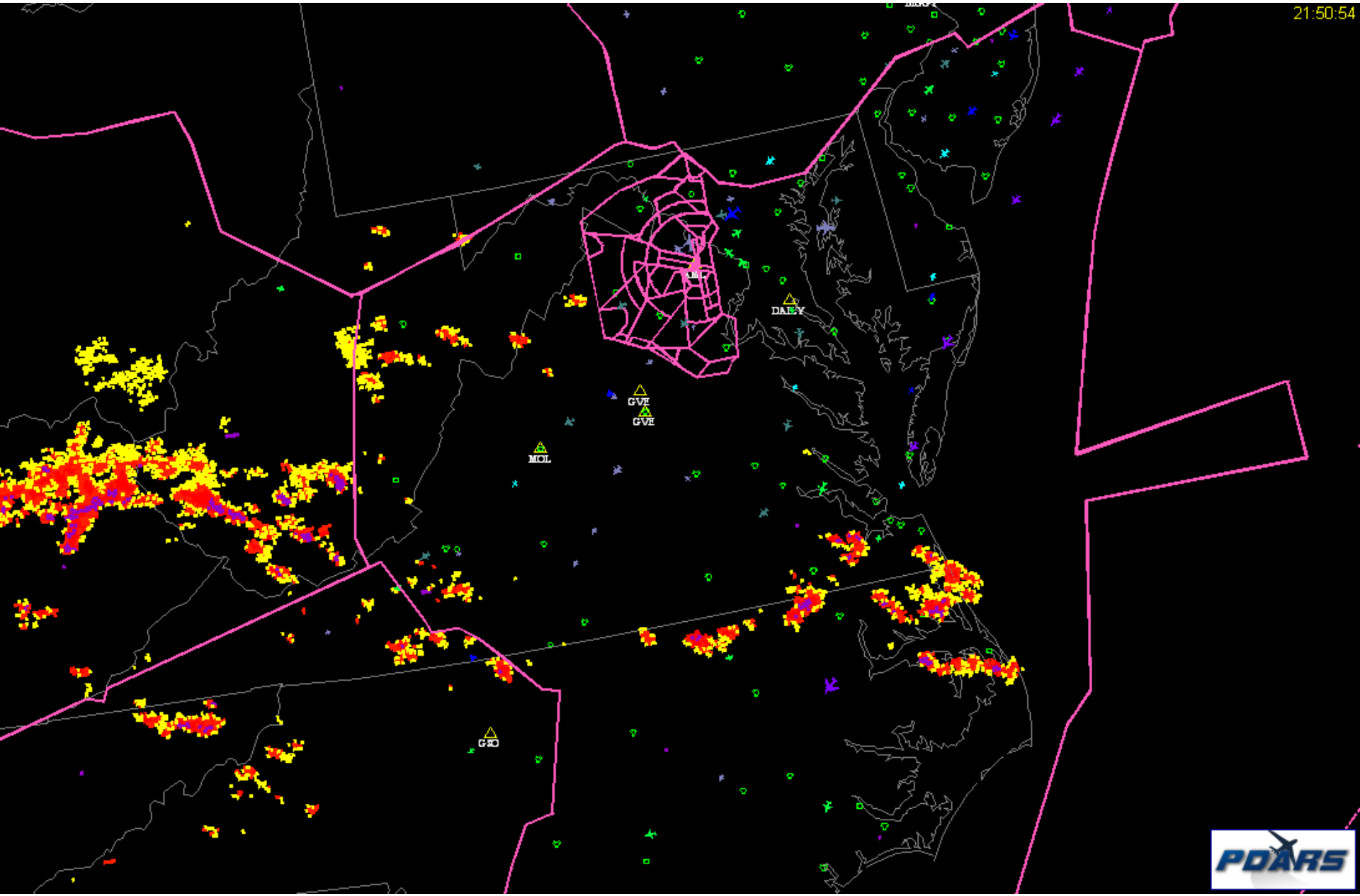
Controller's view

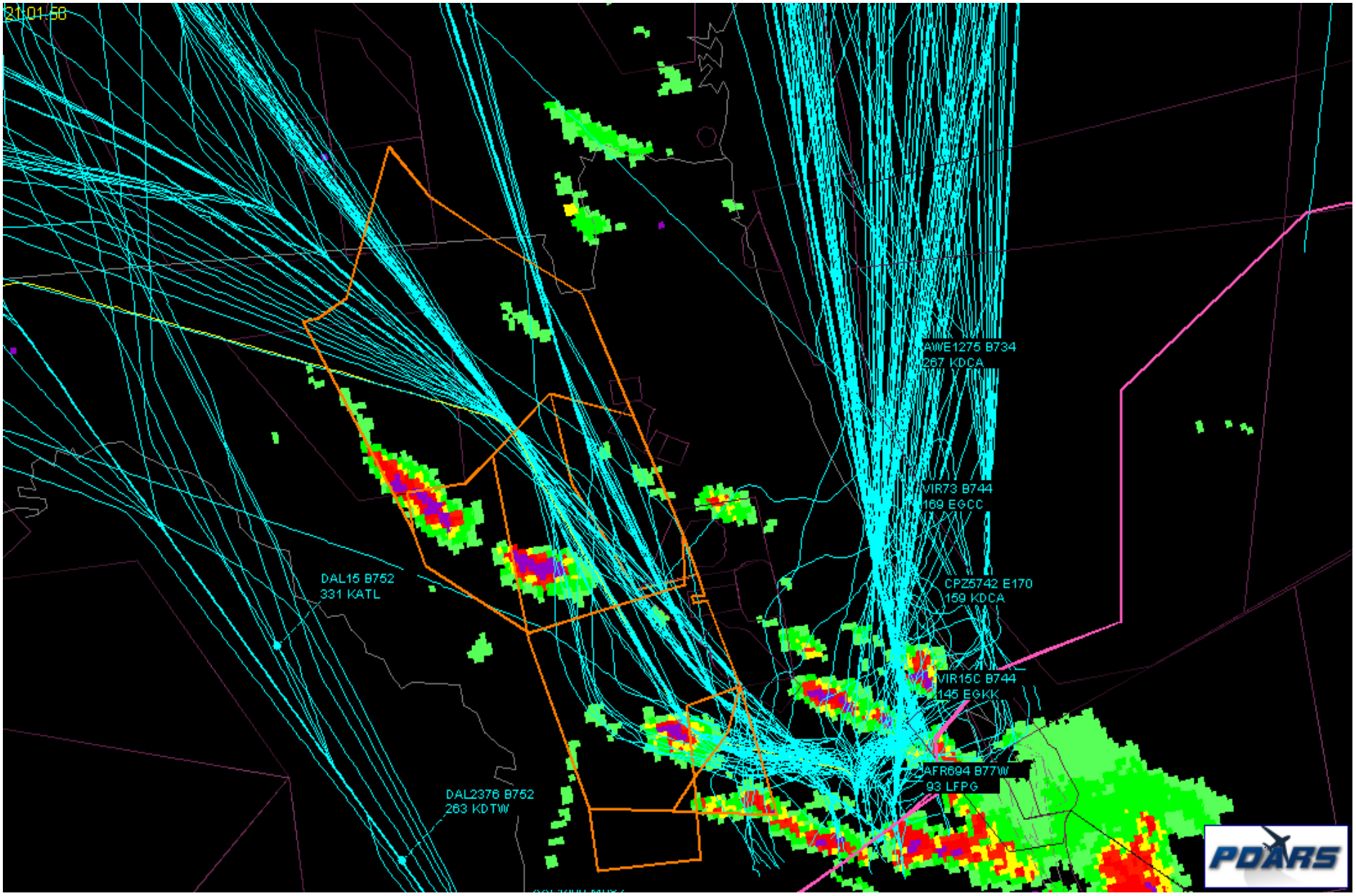
Pilot approaches weather

Flying through “RED”

Florida to the NE Playbook




21:50:54
GVE
GVE
MCL
GSO


21:01:58
AWE1275 B734
267 KDCA
VIR73 B744
169 EGCC
DAL15 B752
331 KATL
CPZ5742 E170
159 KDCA
VIR15C B744
145 EGKK
AFR694 B77W
93 LFPG
DAL2376 B752
263 KDTW
PDARS

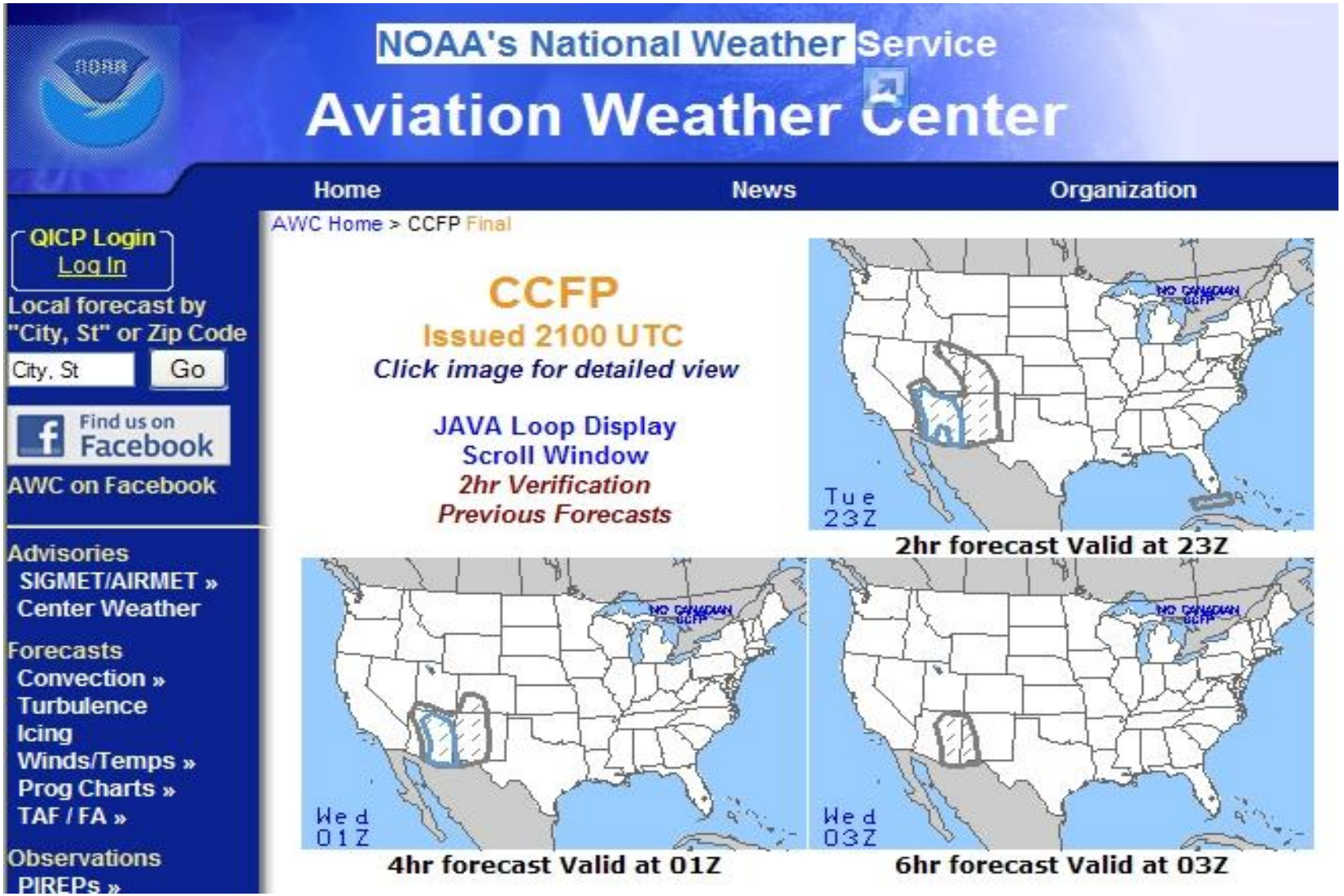
What can we do better

- With additional/specialized training we can reduce the delays and miles flown
- With a better understanding of the flight conditions in the atmosphere and impact to the different classes of aircraft, ATC can better plan for the reduction in volume to accommodate deviation.
- New products be geared toward aviation terms/vocabulary. Ex. FL300 vs. dbz

Backup Slides

Control Room

CCFP


NOAA's National Weather Service
Aviation Weather Center
Home
News
Organization
AWC Home > CCFP Final
QICP Login
Log In
Local forecast by "City, St" or Zip Code
City, St
Go
Find us on Facebook
AWC on Facebook
Advisories
SIGMET/AIRMET »
Center Weather
Forecasts
Convection »
Turbulence
Icing
Winds/Temps »
Prog Charts »
TAF / FA »
Observations
PIREPs »
CCFP
Issued 2100 UTC
Click image for detailed view
JAVA Loop Display
Scroll Window
2hr Verification
Previous Forecasts
Tue 23Z
2hr forecast Valid at 23Z
Wed 01Z
4hr forecast Valid at 01Z
Wed 03Z
6hr forecast Valid at 03Z

Controller Display

Table 1
NEXRAD Color Scheme for Controllers Display

Reflectivity	Color	Phraseology
< 30 dBZ	Blank	N/A
30-40 dBZ	Royal Blue	Moderate precipitation
40-50 dBZ	Checkered Cyan	Heavy precipitation
>50 dBZ	Cyan	Extreme precipitation

Table 2
NEXRAD Layers Available on Controller Displays

Mosaic Name	Layer (ft)
Composite Reflectivity	0-60,000
CR Low	0-24,000
CR High	24,000-33,000
CR Super High	33,000-60,000

OVERCOMING METSPEAK

- Acronym Hell: CoSPA, FAR, PAD, MCS, CACR, RUC, HRRR, WAF
- Met Terms: boundary layer, eddy dissipation rate, mesoscale
- 19th Century solution Beaufort Wind Force Scale, but evolving with technology

Antidotes

- Learn and use air air traffic terms, concepts, problems
- Express weather tools as means to anticipate and overcome problems
- Get inside the head of a traffic management coordinator
- Understand the different roles of airline dispatchers, pilots, controllers (tower, arrival departure, en route) and traffic management coordinators

Discussion Examples

- Integrated Departure Route Planning (IDRP) tool
- Forecasted weather is invisible, implied, and accounted for
- Time Based Flow Metering (TBFM) tool
- Evolving from Traffic Management Advisor
- Will run on ERAM some day
- At heart of NextGen

QUIZ ANSWERS

CTOP – Collaborative Trajectory Options Program

FCA – Flow Constrained Area

CACR – Collaborative Airspace Constraint Resolution

CI – Convective Initiation

FAR – False Alarm Ratio

POD – Probability of Detection

MCS – Mesoscale Convection System

Rapid Refresh (RR) Model – will replace RUC in 2011. Will be parent of HRRR