

Decision Support for Aviation



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Planning....



...is important

The Front Lines of Decision Support

Topics for today's conversation

- history of program
- Decision support = 0-8 hrs
- CWSU philosophy
- Aircraft flying 200-500 mph, can cover hundreds of miles fast: FAA mitigation
- CWSU support in detail
- Future of aviation DS



CWSU Mission: Help FAA produce the safest most efficient National Airspace System

Program History

- Southern 242, 1977
- 1978 NTSB rec
- Initially 3 mets
- MIC added early 80s
- Hours 16/7/365
- CCFP 2000
- Automated tools



4:03:48 Capt: "Looks heavy, nothing's going through that."

4:03:54 Capt: "See that?"

4:03:56 FO: "That's a hole , isn't it?"

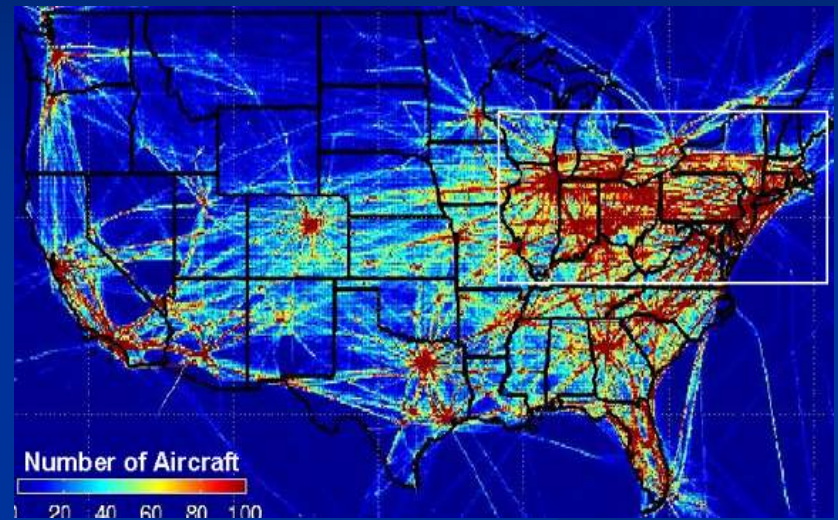
4:03:57 Capt: "It's not showing a hole; see it?"

4:04:05 CAM: (Sound of rain)

4:04:08 FO: "Do you want to go around that right now?"

System Overview

- National Airspace System (NAS)
- Most flights NE-Chicago
- In ZME: ATL and DFW traffic and Memphis Fed Ex



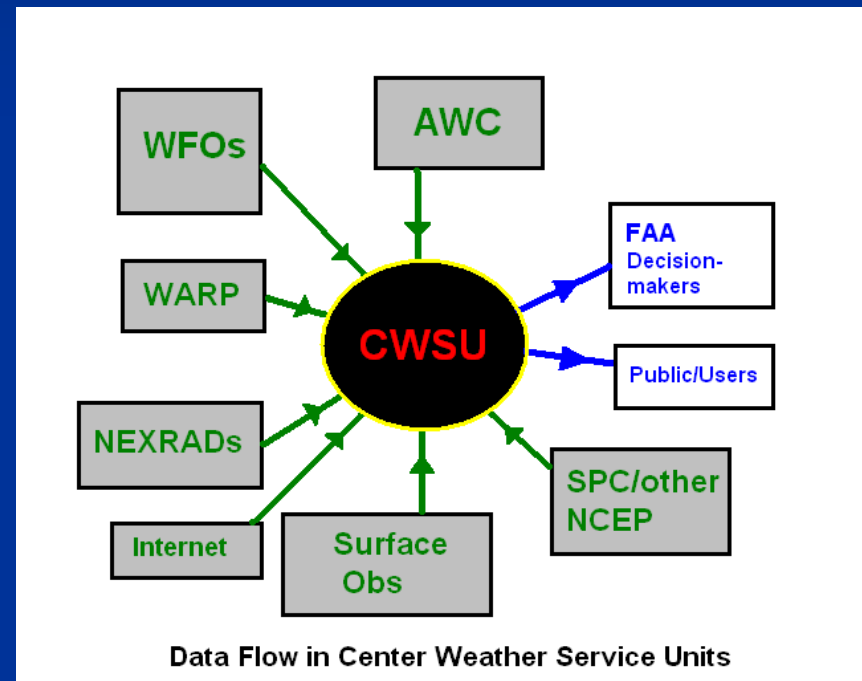
CWSU Philosophy

- 0-2 hours “tactical” environment MOST important
- 2-8 hours “strategic” environment
- Long term needs



CWSU Philosophy

- CWSUs are a clearinghouse of WX info
- CWSU Mets filter and present the info to FAA traffic-managers, adding value where needed
- Face-to-face contact important; if not possible then direct access telephones to the important people— time is usually critical



CWSU Philosophy – Terminal

- Traffic managers sometimes need more detail than a TAF can provide
- CWSU Mets bridge the gap between what is in TAF and what is not
- Similar philosophy to Fire Weather Forecaster

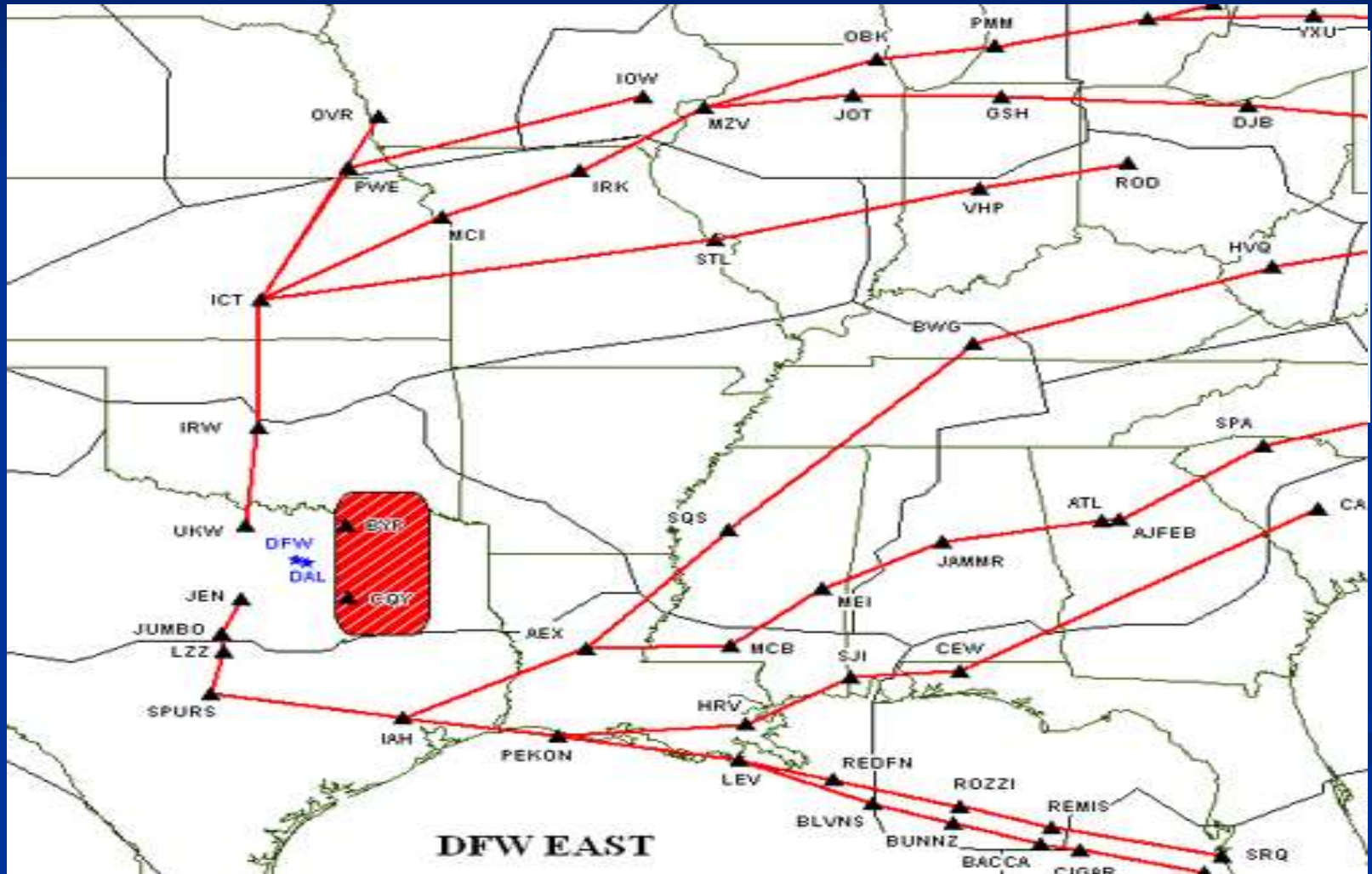
MAXIMUM TAILWIND COMPONENTS

NORTH OPERATION		SOUTH OPERATION	
<u>WIND (Degrees)</u>	<u>VELOCITY (Knots)</u>	<u>WIND (Degrees)</u>	<u>VELOCITY (Knots)</u>
250 – 260	20	280 – 290	20
240	14	300	14
230	10	310	10
220	9	320	9
210	8	330	8
200 – 160	7	340 – 020	7
150	8	030	8
140	9	040	9
130	10	050	10
120	14	060	14
110 – 100	20	070 – 080	20

EAST OPERATION		WEST OPERATION	
<u>WIND (Degrees)</u>	<u>VELOCITY (Knots)</u>	<u>WIND (Degrees)</u>	<u>VELOCITY (Knots)</u>
340 – 350	20	010 – 020	20
330	14	030	14
320	10	040	10
310	9	050	9
300	8	060	8
250 – 290	7	070 – 110	7
240	8	120	8
230	9	130	9
220	10	140	10
210	14	150	14
190 – 200	20	160 – 170	20

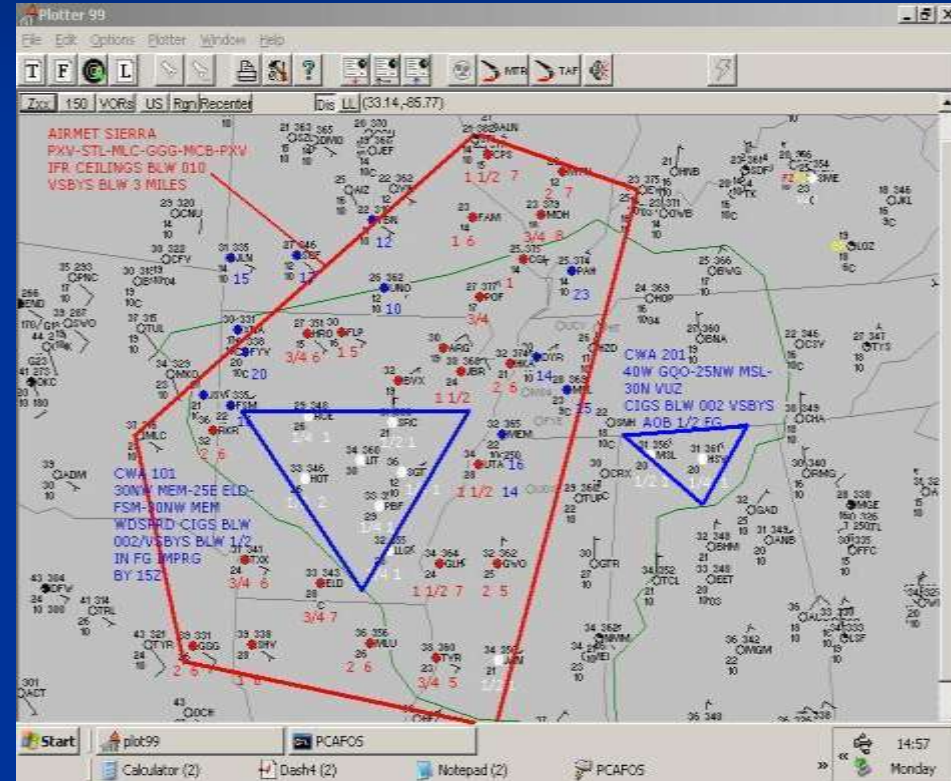
Runway configuration for landing – often depends on 1-3 knots of wind

CWSU Philosophy – En-Route



Products

- **MIS = Meteorological Impact Statement**
- **0-12 hours; event-driven**
- **CWA = Center Weather Advisory**
- **0-2 hours; event-driven**
- **Internet products**
- **Memphis Overnight Briefing 10pm – 4am; more soon**



“Plotter” program, near-real time plot of Metars and Aviation warnings/advisories

Intangibles

- Ad-hoc briefings when needed = immediate Decision Support
- Support for military operations as they impact FAA
- Hazmat situations; CWAs for how dispersal will affect aviation?
- Bridge of weather knowledge – formal and informal training

FAA Mitigation

- **“Traffic Management Initiatives” – delays!**
- **Designed to limit the number of airplanes to match the capacity of the system**
- **Prevents ‘near-misses’ and hopefully accidents**
- **Based largely on NWS weather forecasts**
- **2 hourly telcon to discuss**
- **Re-routes, Ground Stops, Ground Delays, Airspace Flow Programs**

FAA Mitigation

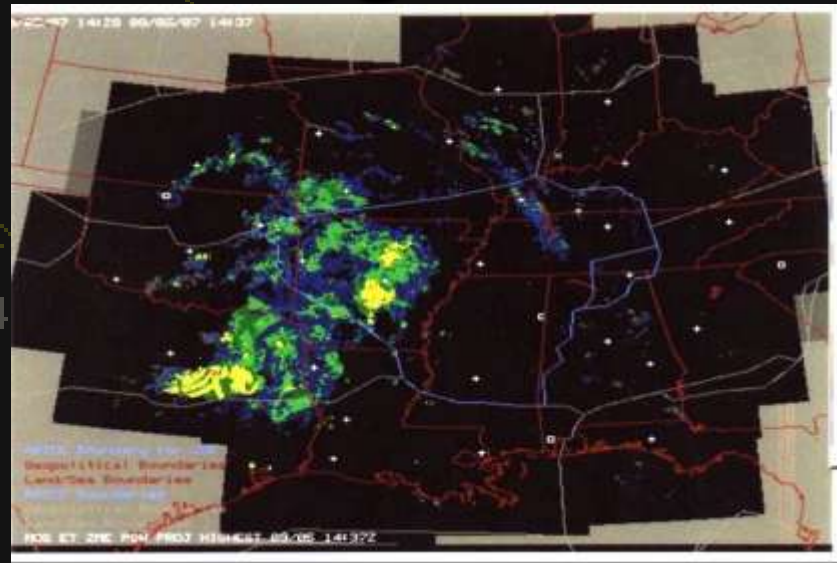
- Things don't always go as planned!
- CWSU forecaster met-watch to make sure plan is working
- Immediate consultation allows for change on the fly



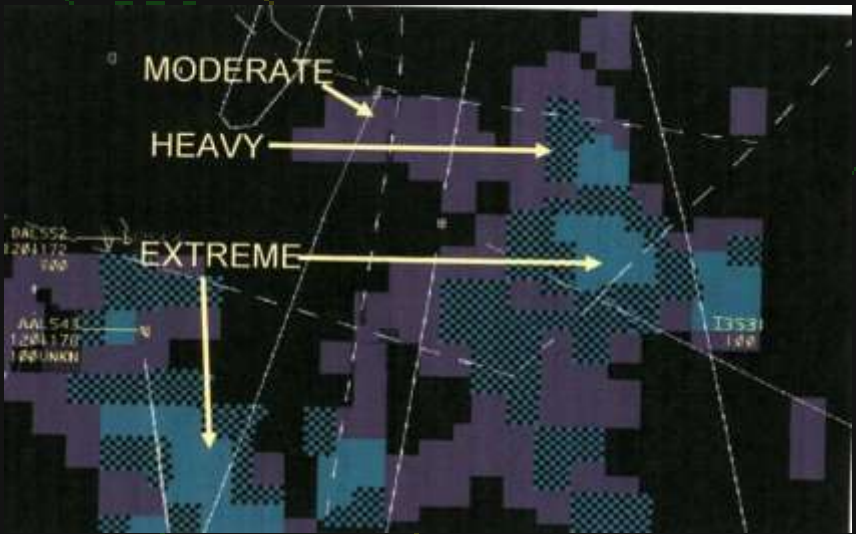
FAA Mitigation – Monitoring Tools



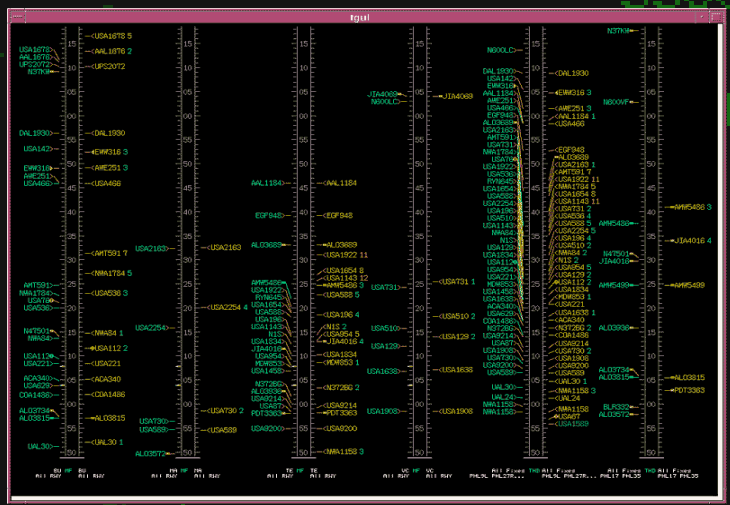
WARP National Mosaic Radar



Regional Mosaic Echo Tops

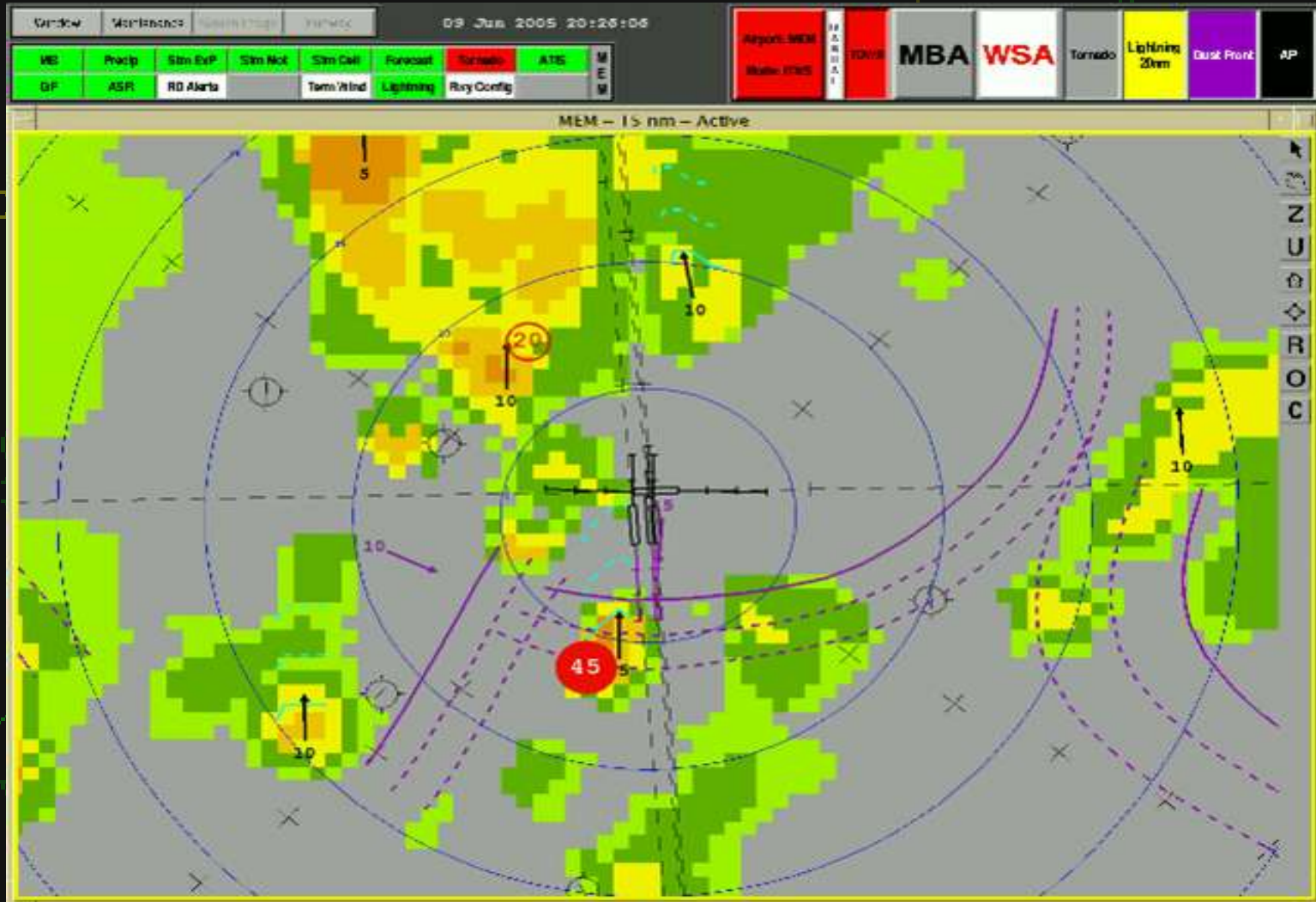


NEXRAD "on the glass" (on ATC scopes)



Traffic Management Advisor (TMA)

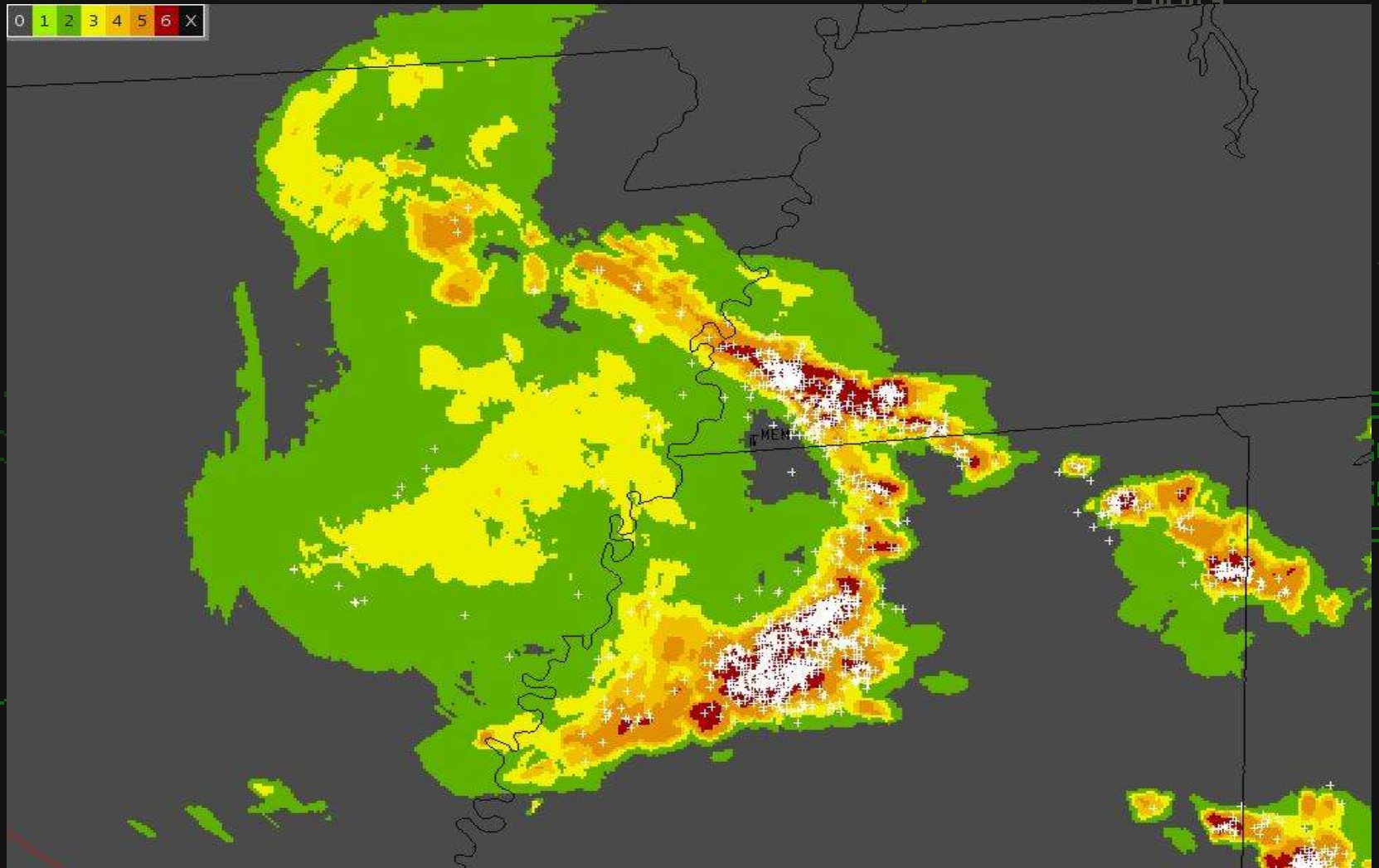
FAA Mitigation – Monitoring Tools



Integrated Terminal Weather System (ITWS)

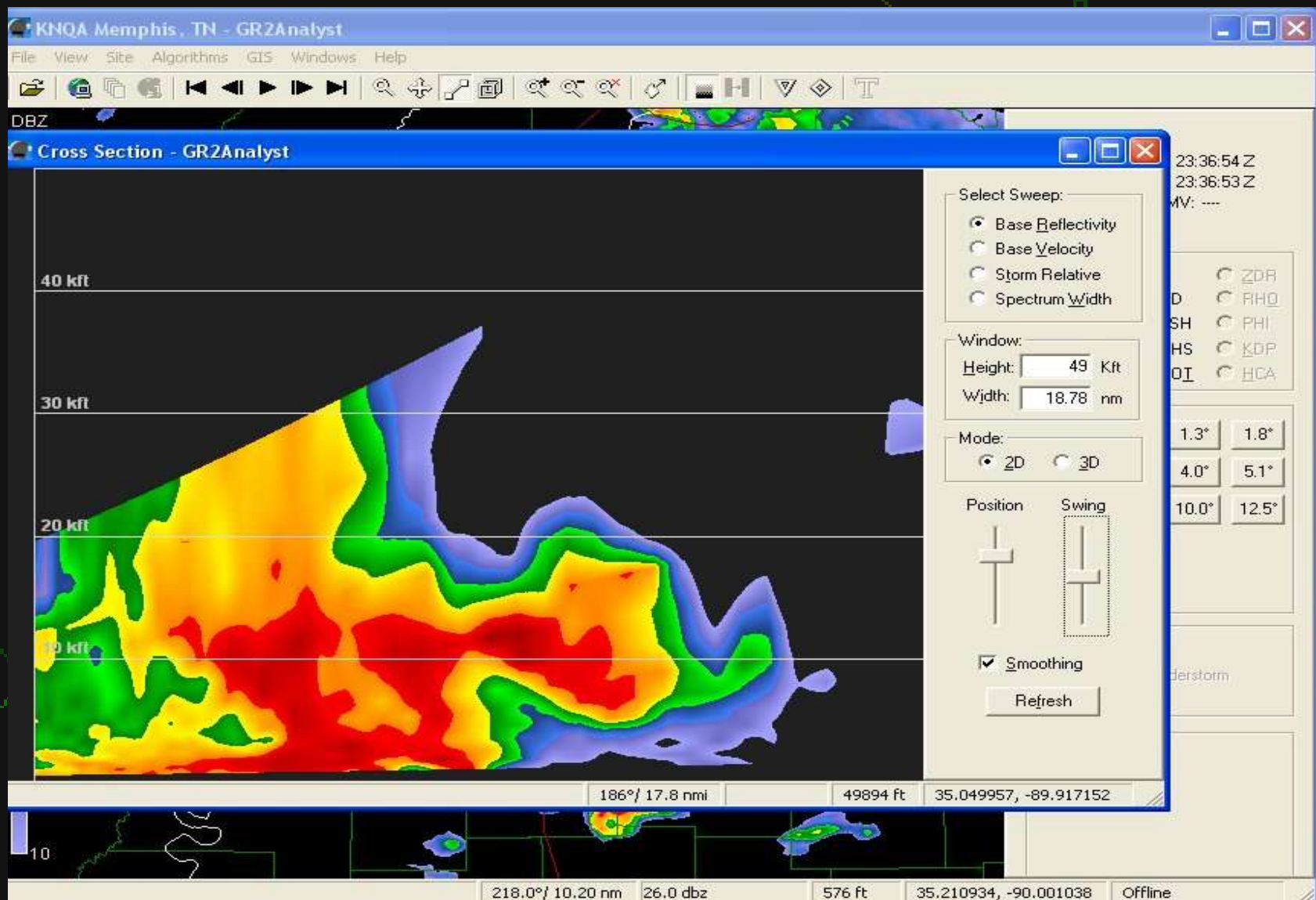
ASQ52
330C
455 43
CRJ7/0

FAA Mitigation – Monitoring Tools



Corridor Integrated Weather System (CIWS)

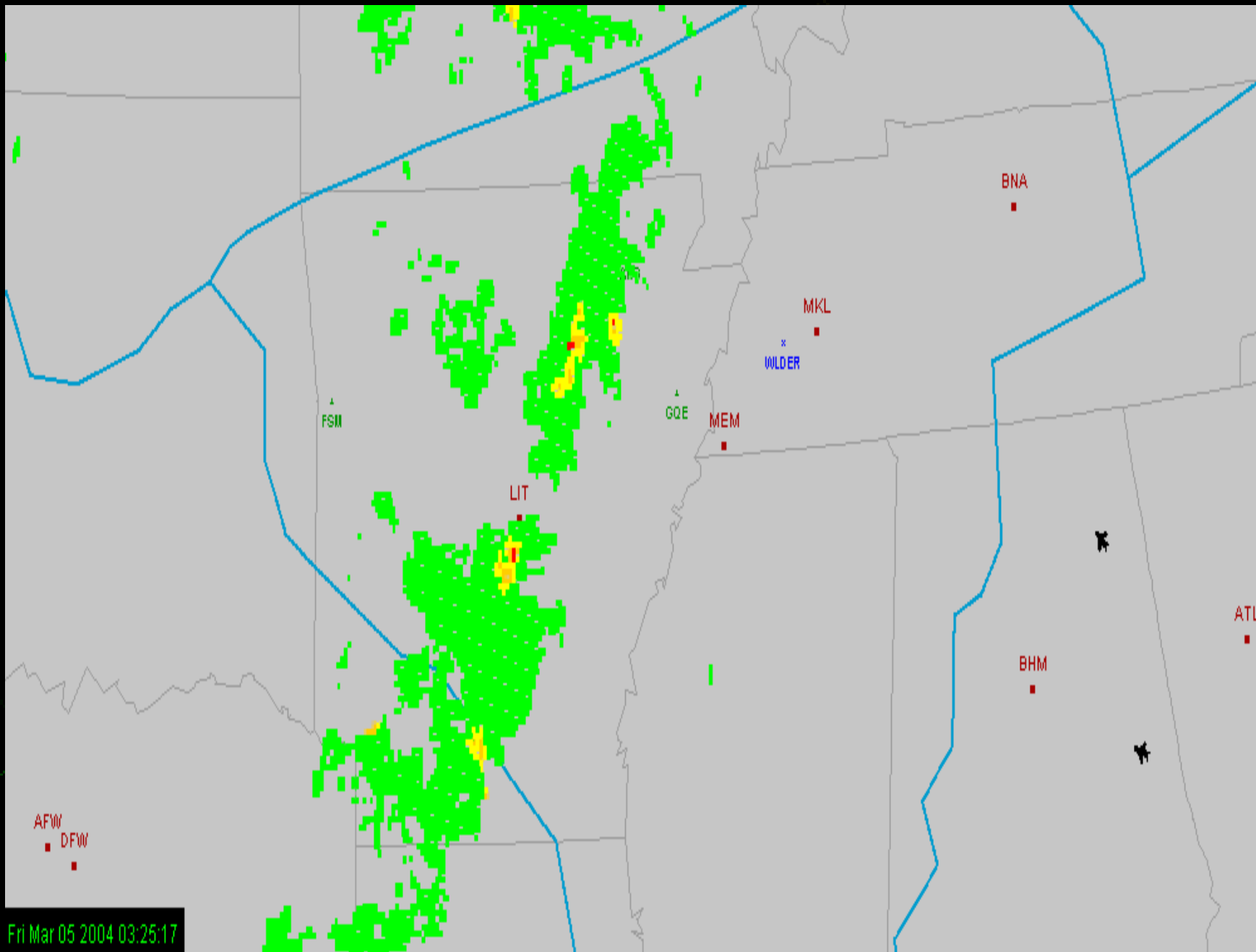
FAA Mitigation – Monitoring Tools



GR2 Analyst cross section Feb 5 tornadic cell MEM

Cargo Ops Support

- **FedEx- MEM is busiest cargo airport in world**
- **120-150 aircraft arrive M-F between 10pm-1am**
- **Decisions made around 6 pm**
- **Met watch to make sure plan is working**



Inbound Fed Ex Rush with Weather and Wind

Terminal/Cargo Ops Support

MEMPHIS TRACON OVERNIGHT BRIEFING

for air traffic planning purposes only

Memphis TRACON area only--valid from 10:00 PM through 4:00 AM

Valid: 24/0300Z – 241000Z

	10 PM	Midnight	2 AM	4 AM (outbounds)
SFC winds(kt)	26006	27006	27006	28006
SFC sky/ceiling	OVC020	OVC025	OVC030	OVC035
SFC vsby	10SM	10SM	10SM	10SM
SFC WX				
1000 ft winds	30015	29012	27010	27010
2000 ft winds	30015	29012	28010	27010

ARRIVAL GATES IMPACTED WITH T-STORMS:

GQE UJM HLI WLDER

Memphis Overnight Briefing - on ZME website before 6 pm local
Standard Time TAF = 5:30 pm / Daylight Time TAF = 6:30 pm

Coordination is a must, so we produce an “ADMZME”

Terminal/Cargo Ops Support

Page 1 of 1

ZCZC MEGADMZME
TTAA00 KMEG 011500
CWSU COORDINATION MESSAGE
1000 AM CDT APR 1 2008

GRADIENT SETTING UP FOR NORTH-NORTHEAST FLOW ALL DAY. MAV/LAV APPEAR
REASONABLE SHOWING 7-12 KT THRU THE DAYLIGHT HOURS. NO CIGS ANTICIPATED.
CURRENT TAF LOOK GOOD HERE.

CURRENT ACCEPTANCE RATE= 95

AIRPORT INFORMATION= <http://www.fly.faa.gov/Products/AADC/aadc.html>

DAY/EVE

#Rwy	Ops	VMC	MVMC	IMC	LIMC
3	N	95	87	n/a	n/a
3	S	87	75	n/a	n/a
2	N	70	61	70	50
2	S	70	61	70	n/a
1	-	35	35	35	25

FDX

#Rwy	Ops	VMC	MVMC	IMC	LIMC
3	N	81	77	n/a	n/a
3	S	77	77	n/a	n/a
2	N	56	52	56	52
2	S	56	52	56	n/a
1	-	28	26	26	26

ADMZME = CWSU Coord Msg - Issued 10-11:15am; 4-5:15pm

Emergency Support

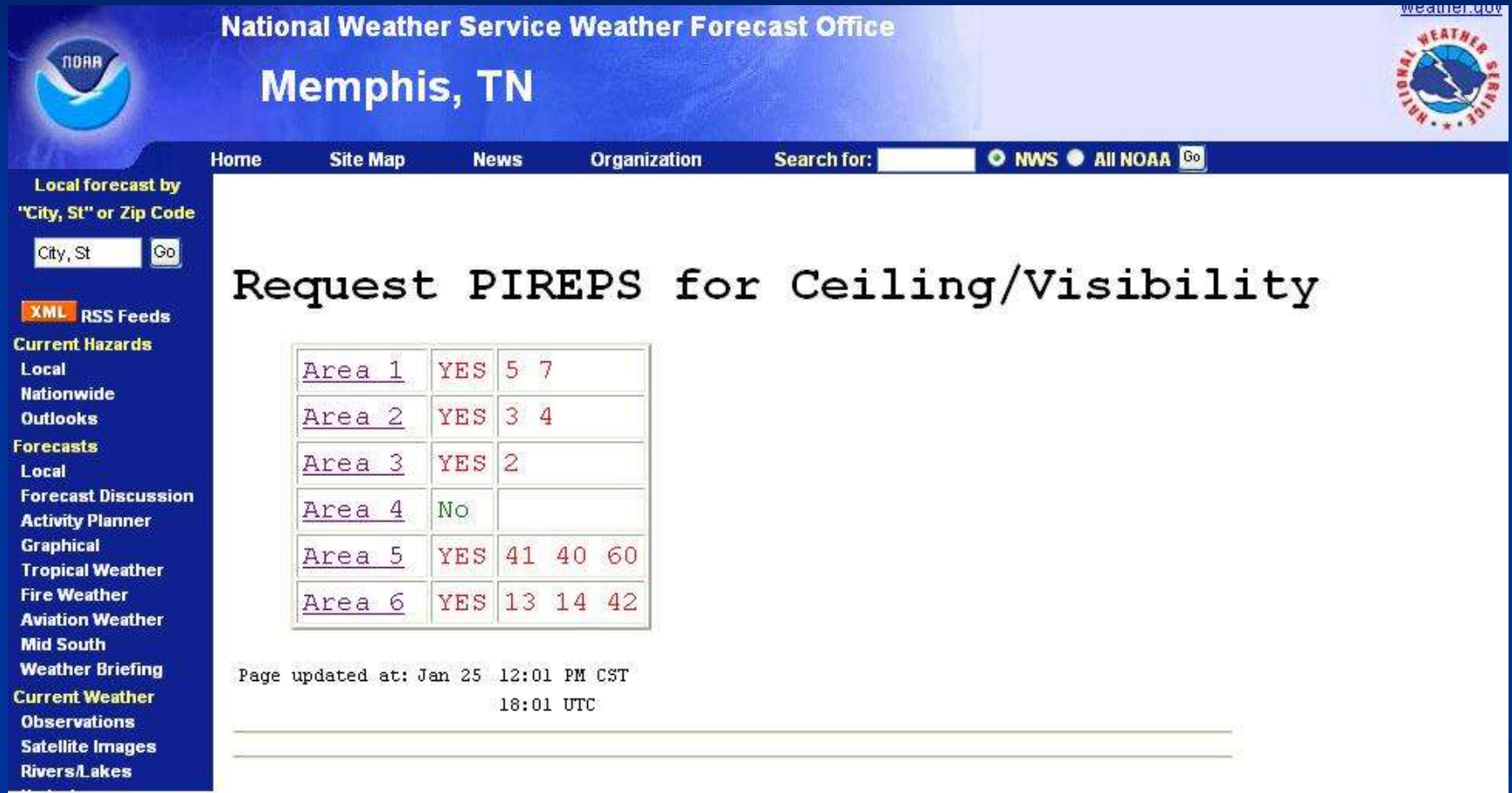
CWSU Memphis Received Mention in the “Super Tuesday Tornado Outbreak of February 5, 2008 Service Assessment” Page 20:

ARTCC air traffic controllers gave high praise for the efforts of the CWSU meteorologists. The air traffic controllers specifically mentioned their accuracy with timing of high impact weather phenomena, and with sudden changes in conditions. One controller noted that, “*the CWSU guys were dead on*” regarding the timing of convective features. That same controller mentioned, “*We would be blind without them.*”

Letter of Appreciation for controllers and meteorologist

VFR ‘Trapped on Top’ event, 2008

Extra Support



The screenshot shows the National Weather Service website for Memphis, TN. The page title is "Request PIREPS for Ceiling/Visibility". A table lists six areas with their respective PIREPS status and counts. The table is as follows:

Area 1	YES	5	7
Area 2	YES	3	4
Area 3	YES	2	
Area 4	No		
Area 5	YES	41	40 60
Area 6	YES	13	14 42

Page updated at: Jan 25 12:01 PM CST
18:01 UTC

Chart Developed by CWSU and WFO MEG to signal controllers to the need for soliciting ceiling/visibility PIREPS

The Future of Aviation Decision Support

- New technologies mean more automation
- Decision Support tools are being made available for FAA non-meteorologists
- With **NEXTGEN** coming, more tools; consolidation?

Questions?

