

Segment 4: Progress in Strategic Convective Weather Info for ATM in Complex Airspace

Friends/Partners Aviation Weather
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NORTHWEST AIRLINES.

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Comments on 2 Topics

- CDM Steering Group (CSG) Directives
- Wind Shear Info

Collaborative Convective Forecast Product

- Progress

- Intuitive Format introduced March 2005

Additional Opportunities

- CDM Steering Group (CSG) Directives
 - Define New Terminal Area Convection Fcst Product
 - Focus on CCFP Granularity & Verification

CCFP Definitions

Source: Statement of User Needs - CCFP 2005

CCFP Purpose (Section 1.1):

“...to be used for strategic planning of air traffic flow management during the **en route** phase of flight. It is **not intended to be used for traffic flow control in the airport terminal environment, ...”**

CCFP Minimum Threshold (Section 2.1):

- Polygon of at Least 3000 sq. miles that contains:

Coverage

- Composite reflectivity of at least 40dbZ is expected to cover at least 25% of the forecast area, and
- Echo top of 25,000 feet Mean Sea Level (MSL), or greater, are expected to cover at least 25% of the forecast area, and

Confidence

- A confidence of at least 25% that above 2 minimum criteria will be met.

CSG Recommendation - Psbl Implementation

- **New Terminal Area Product**
- **CCFP Granularity**

- **Is 3000 sq. miles the correct threshold?**

- In the Airport Terminal Environment?

- In the En Route Environment?

- **3000 sq miles of what?**

- Level 3 or higher Reflectivity? - 4km squares or

- Traffic Impacted Areas? - 40nm diameter circles

- **Specific Opportunities**

- Develop a Terminal Environment Product

- Further Define En Route Threshold

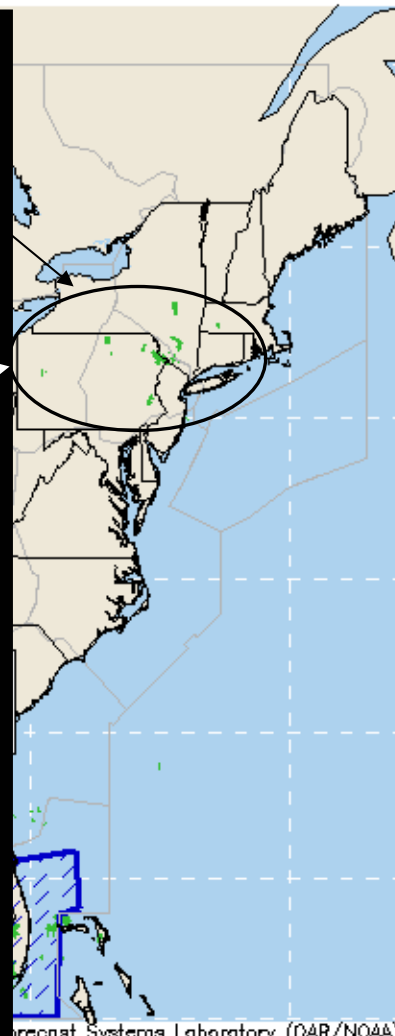
Convection 22Jun05 @17Z

Green =

4km squares of Level 3 & Higher Wx Radar Reflectivity

Is this More
or
Less than
3000 sq miles?

Answer: LESS- Approx 2000 sq miles



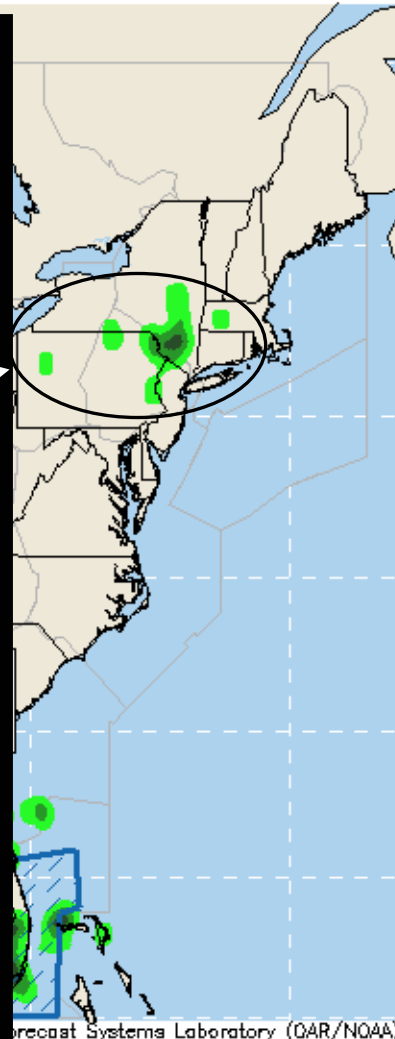
Same Convection 22Jun05 @ 17Z

3 shades of Green =

40nm diameter circles w/ Solid, Bkn or Sct coverage

Is this More
or
Less than
3000 sq miles?

Answer: MORE - Approx 19,000 sq miles



CSG Recommendation - Psbl Implementation

- **Verification**

–Measurements of Both VALUE & ACCURACY

Value

Measurements of CCFP Value for Decisions by Airspace Users

Accuracy

Measurements of CCFP Accuracy for Producers (Meteorologists)

- **Specific Opportunities**

- Continue Efforts on Accuracy Measures
- Initiate Maximum Tops Verification
- Initiate Measurements of CCFP Value

Wind Shear

- Progress
 - Observation/Detection Capabilities

Additional Opportunities

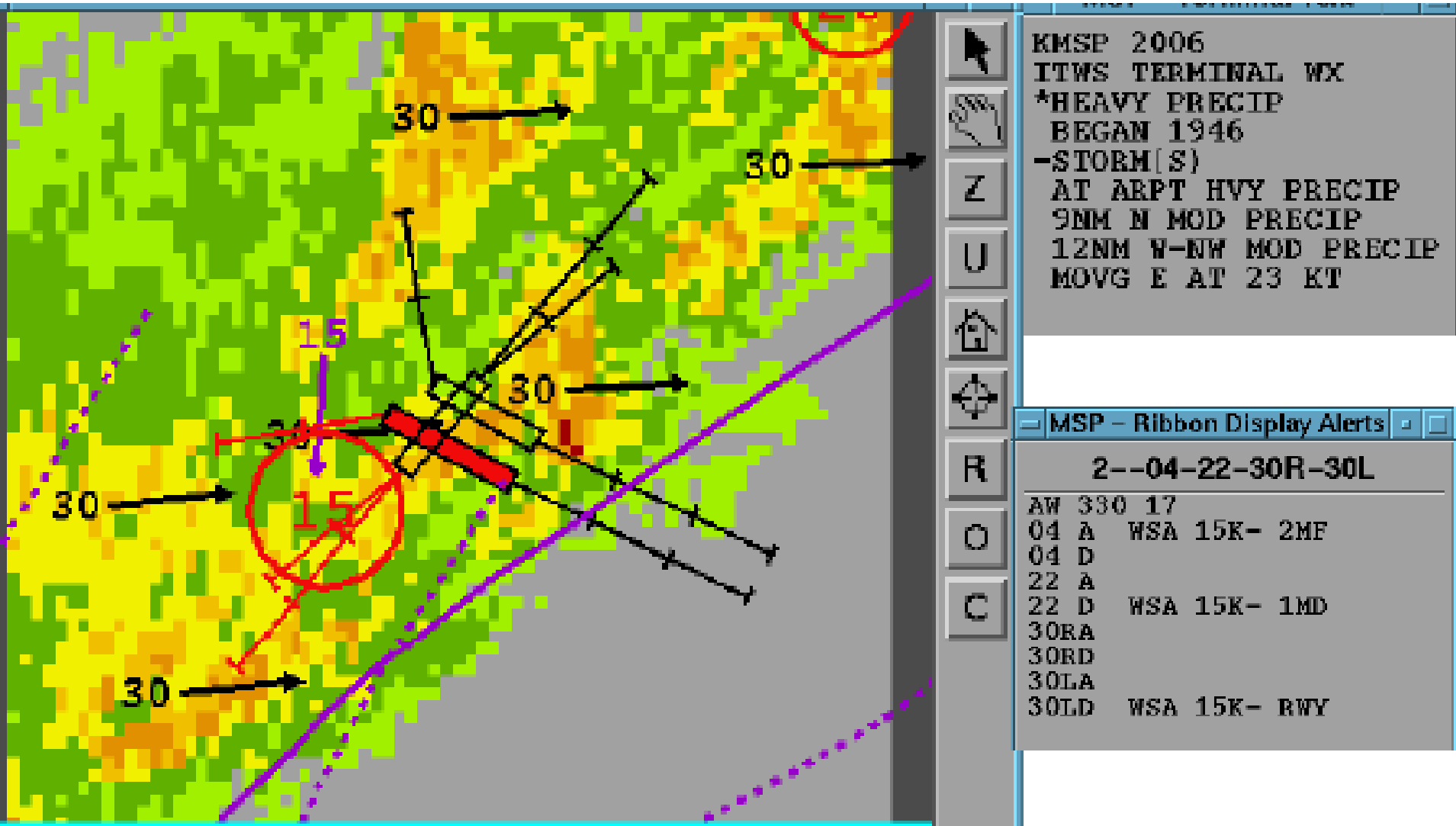
- Observation/Detection Capability
 - Dry regime (Wind Shear w/ Weak or No Convection)
- Distribution
 - Access to Graphics
 - Access to Text Advisories

Wind Shear

Current Observation Capability

- Current: Human-in-the-Loop
 - Pilot Reports to ATC after Encountered (PIREP)
- Current: Automated
 - 117 U. S. Airports w/ Ground Based Detection
 - 43 Airports: Terminal Doppler Weather Radar (TDWR)
 - 11 of 43 Upgraded to Integrated Terminal Weather System (ITWS)
 - 40 Airports: Low Level Windshear Advisory System (LLWAS)
 - 34 Airports: Weather System Processor (WSP)

ITWS Display with Wind Shear Identified



Wind Shear Hazard Info - Distribution

At 43 Airports w/ TDWR

**Avail. to Pilots & AOC's
Via TWIP**

```
KMSP 2013  
ITWS TERMINAL WX  
*WIND SHEAR ALERTS  
20 KT LOSS  
BEGAN 2006  
-STORM(S)
```

**Automated Distribution
Text - No Graphics**

At 117 Airports

**Runway Specific Info
Relayed By ATC to A/C**

```
2--04-22-30R-30L  
-----  
AW CALM  
04 A WSA 15K- 2MF  
04 D  
22 A  
22 D WSA 15K- 1MD  
30RA
```

**Human-In-Loop
Distribution**

Conclusions

Future Opportunities

Weather Info for ATM in Complex Airspace

- CCFP Verification & Value
- Additional Definition CCFP Minimum Threshold
- Definition of a Terminal Environment Product
- Wind Shear Information Distribution
- Wind Shear Detection Capability

Supporting Slides

Use only if requested

&

Time available

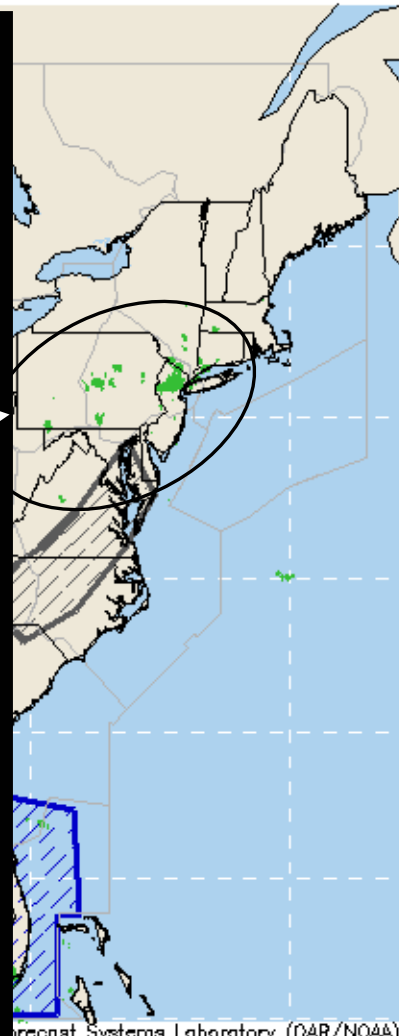
Convection 22Jun05 @19Z

Green =

4km squares of Level 3 & Higher Wx Radar Reflectivity

Is this More
or
Less than
3000 sq miles?

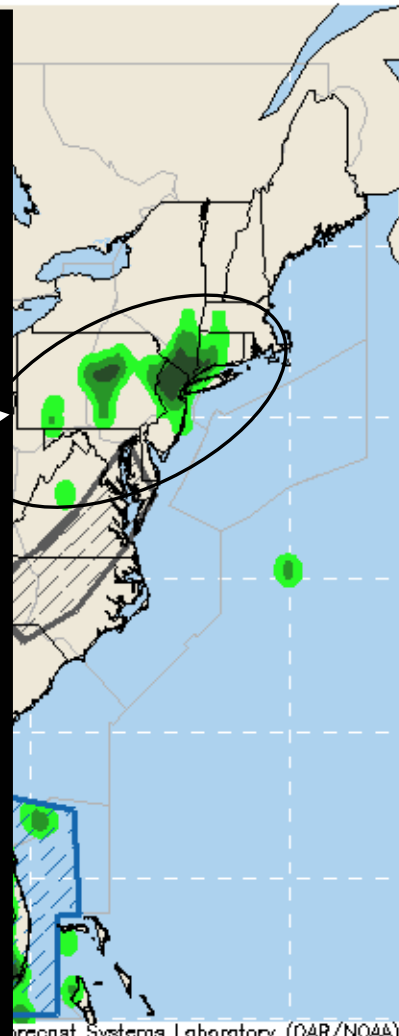
Answer: MORE - Approx 6000 sq miles



Same Convection 22Jun05 @19Z

3 shades of Green =
40nm diameter circles w/ Solid, Bkn or Sct coverage

Is this More
or
Less than
3000 sq miles?



Answer: MORE - Approx 40,000 sq miles

2 Convection Related Topics

Details	CCFP	Wind Shear
Product Type	Forecast: 2,4 & 6 Hrs	Observation
Update Period	Every 2 Hours	Every 1 Minute
Production	Human-In-Loop	Automated
Avoiding	Congested Air Traffic	Ground Proximity
Distribution -Automated -Human-in-Loop	Graphics via Web Posting by AWC	via TWIP Verbally by Tower
Purpose	Efficiency	Safety

In Situ Turbc Sensing & Reporting Concept of Use

- Progress
 - FAA 18 Month Project & Document Drafted

Additional Clarification

- Air Traffic & Operator Roles in Turbc Avoidance
- Add Human-in-Loop Forecasting Systems (e.g. EWINS)
- Add Turbc Reporting Methods
 - Operator Automated as well as Manual Reporting to WMSCR
 - Operator initiated uplinks to A/C