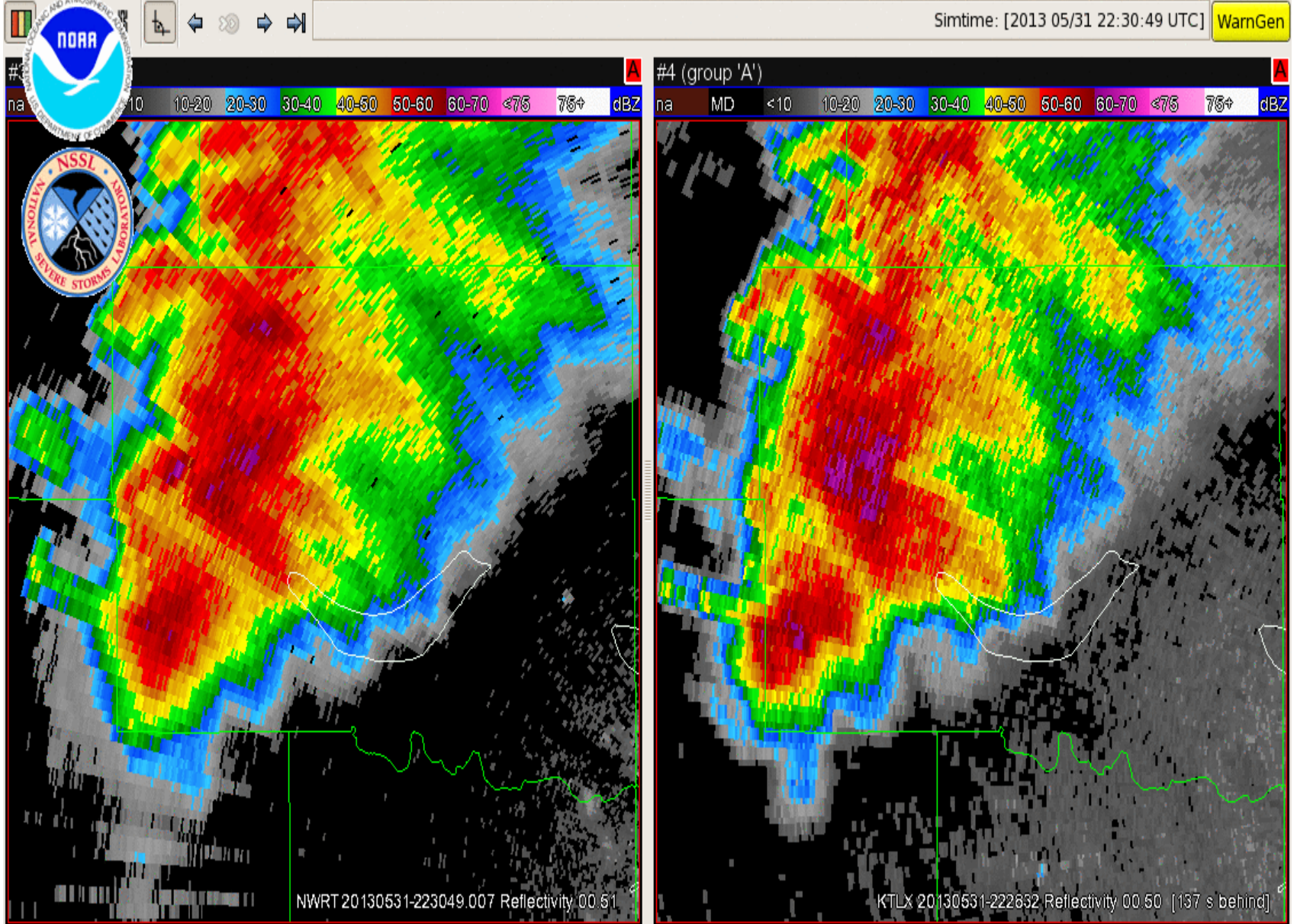


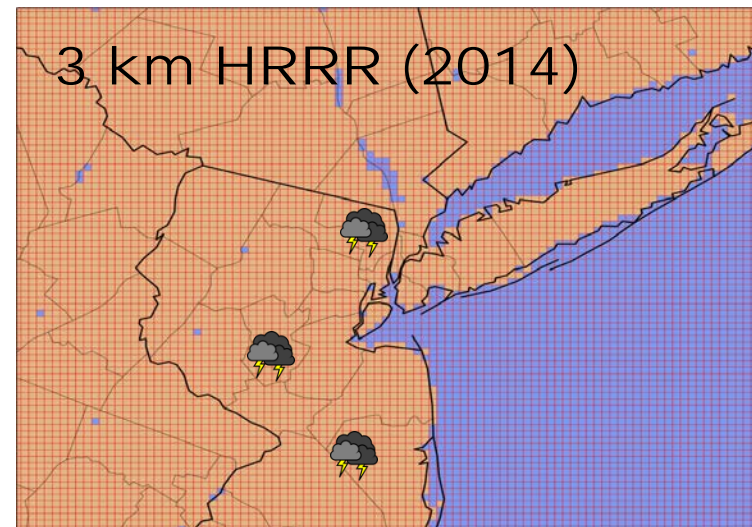
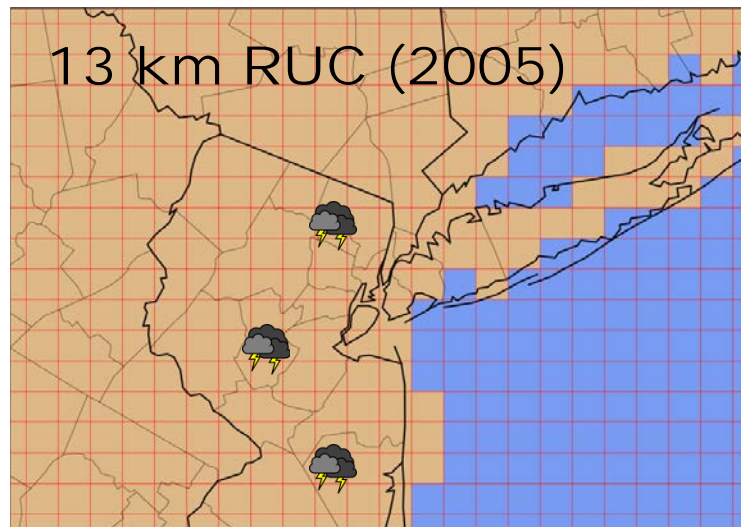
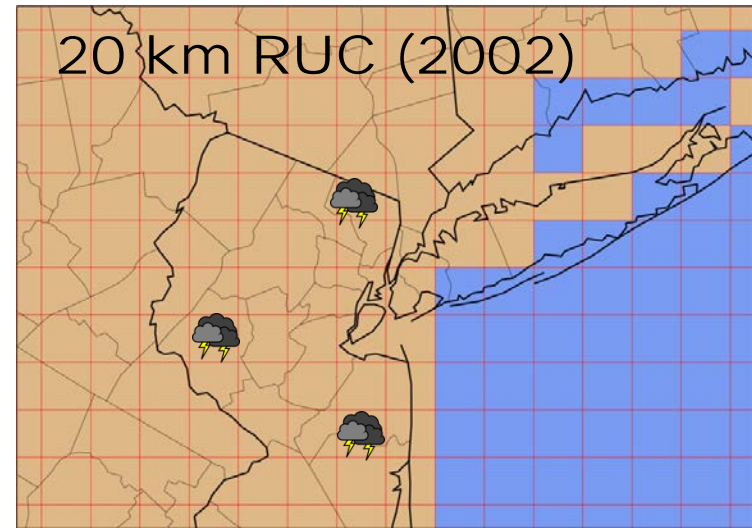
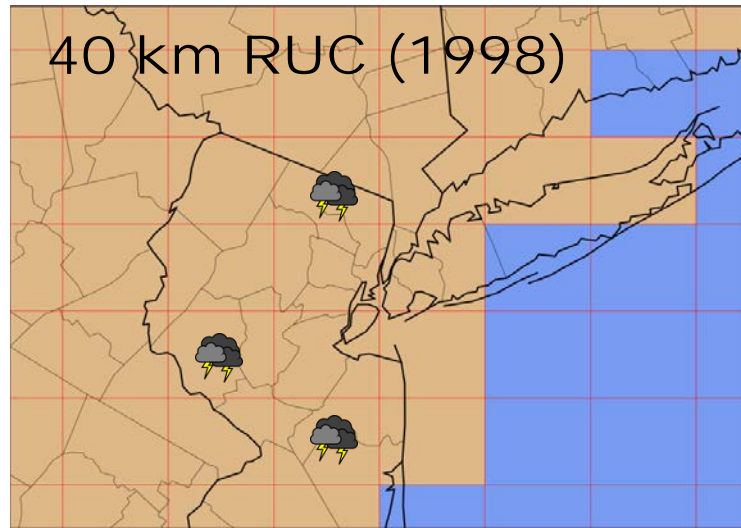
# Resolution Improvements for Aviation Weather Destined for the Cockpit

John McCarthy, PhD  
Palm Desert, CA  
FPAW Las Vegas, NV  
October 11, 2017



El Reno, Oklahoma EF-5 Tornado, May 13, 2013. Phased array Radar 1 second data on left, 1 minute data from NEXRAD (WSR 88-D) radar on right. Incredible resolution coming, results will have to be parameterized for cockpit use. From Webber, NSSL

# High Impact Prediction Needs: Higher Resolution Models



Numerical products with ever-increasing resolution, so 3 km scale allows for detailed thunderstorm picture. Except same for regions of flight avoidance and reroute through hazardous weather.

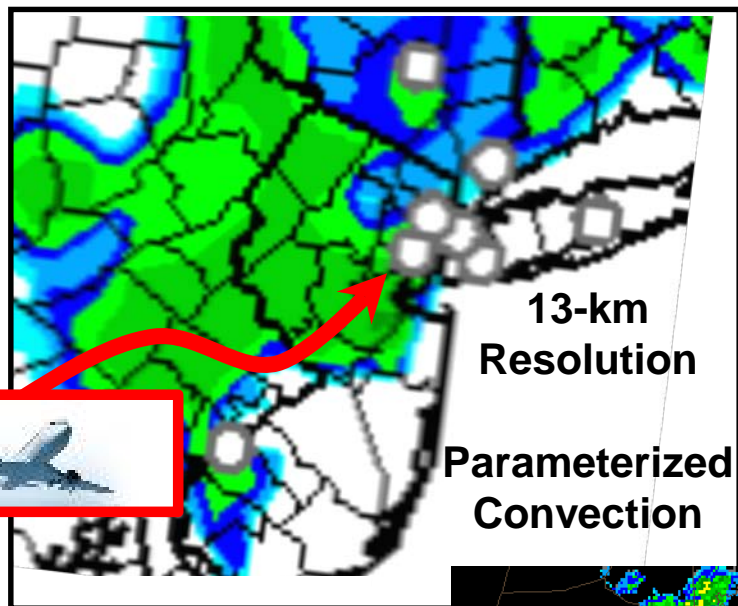
Stephen Weygandt, Assimilation Section Head, NOAA Earth System Research Laboratory /Boulder, CO



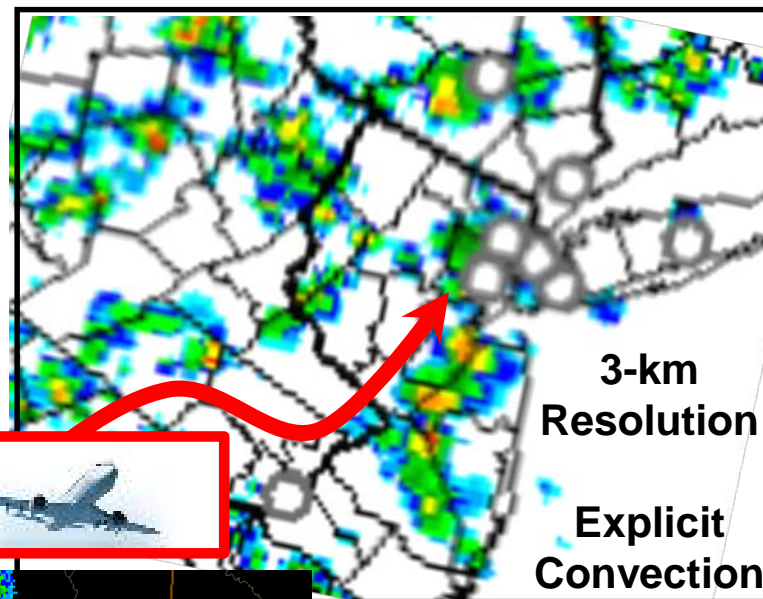


# 3-km HRRR – what it gets you...

13-km 6hr forecast



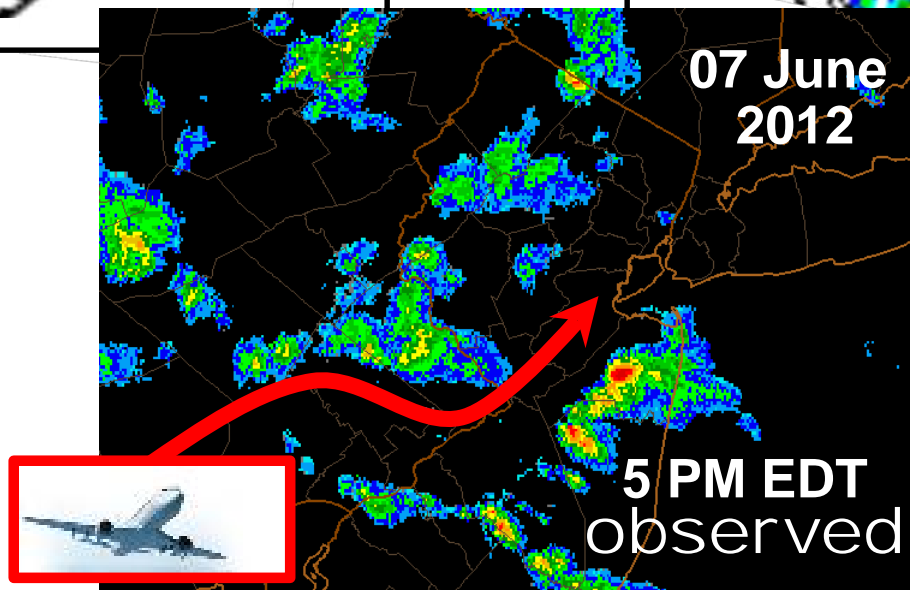
3-km HRRR 6hr forecast



13-km

**NO  
STORM  
STRUCTURE**

**NO ESTIMATE OF  
FLIGHT  
PERMEABILITY**



3-km

**ACCURATE  
STORM  
STRUCTURE**

**ACCURATE ESTIMATE  
OF FLIGHT  
PERMEABILITY**

# TIME/SPACE WX SCALE CHANGES - Cockpit

Cockpit Weather Availability	
➤ Paper weather briefing	Hours
➤ X or C band on-board radar	Minutes

Cockpit weather graphic products	
➤ Early	10 Minutes
➤ Mid	5 Minutes
➤ Current	Minutes
➤ Future	0 to Minus 5 Minutes

# NWP Program

## NextGen Weather Processor (NWP)

- Focuses on weather product generation, translation, and display for aviation weather users
- NEXGEN WEATHER PROCESSOR\* will all for the decommissioning of legacy weather processor systems (e.g., WARP, ITWS, CIWS)

### Capabilities

- **Produces advanced aviation specific weather products**
  - 0 to 8 hour aviation weather products
  - Real-time weather radar information (e.g., ERAM)
  - Convective Weather Avoidance Fields
  - Wind Shear alerts
- **Translates weather information into weather avoidance areas for integration into decision support tools (e.g., TFMS, TBFM)**
- **Provides Aviation Weather Display (AWD) of NextGen weather information for ATC users**
- **\*NWP in detail in next session.**

### Benefits

- **Improve accuracy, timeliness and look ahead (0-8 hour) of aviation-specific weather information to air traffic**
- **Reduce avoidable air traffic delays and maximize available runway and airspace usage**
- **Enhance weather algorithms**
- **Establish weather processing platform, reducing operational costs by consolidating legacy processors**

## NextGen Weather Stakeholders (e.g.)

