



# NOAA's Aviation Weather Center

Fred Johnson

Chief, Domestic Operations Branch

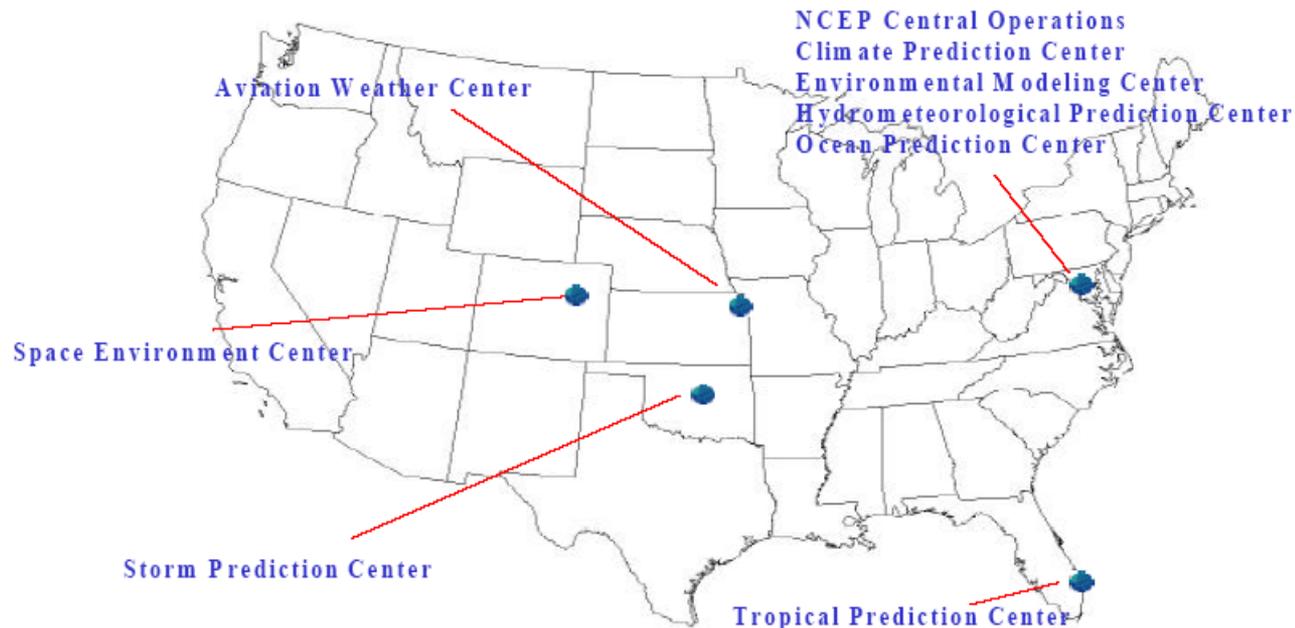


# AWC is One of 9 NCEP Centers

- NOAA → NWS → National Centers for Environmental Prediction → AWC

## NCEP Center Locations

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# AWC's Mission

The Aviation Weather Center delivers  
consistent, timely and accurate weather information  
for the world airspace system.

We are a team of highly skilled people  
dedicated to working with our customers and partners  
to enhance  
safe and efficient flight.



# AWC's Vision

The trusted authority  
and leading innovator  
for aviation weather information.



# AWC Products

## U.S. (except Alaska and Hawaii)

- Flight Hazard Forecasts and Warnings
  - Convective SIGMET
  - SIGMET
  - AIRMET
  - Area Forecasts
  - Low Level Significant Wx
  - Collaborative Convective Forecast Product (CCFP)

## Global and Oceanic

- Flight Weather Forecasts Maps for the entire World (Airlines)
  - Mid-Level Significant Wx
  - High Level Significant Wx
- Flight Hazard Warnings for Atlantic and Pacific
  - International SIGMET
  - Tropical Aviation Wx
- International Flight Folders for Airlines

## New Automated Products

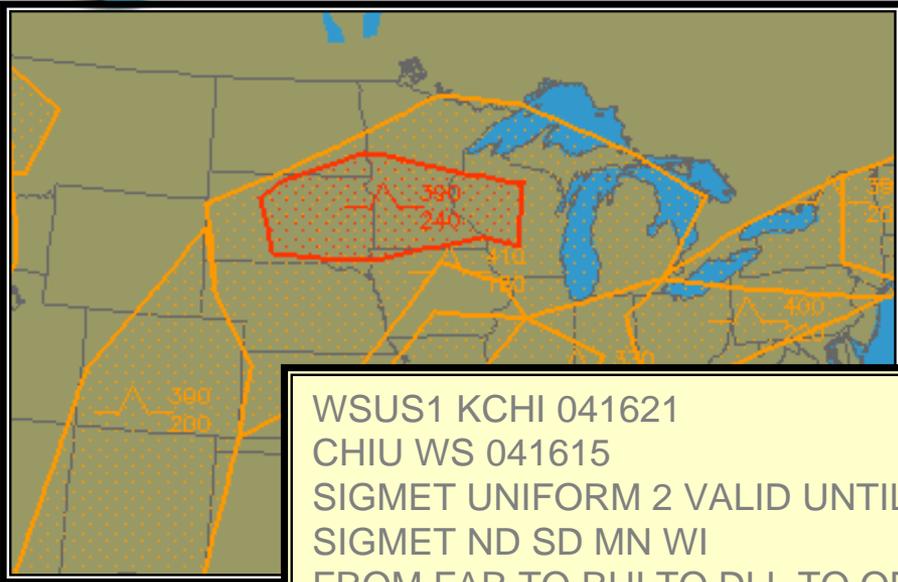
- Funded by FAA's Research \$\$
  - Graphical area Forecast
  - Graphical Turbulence Guidance
  - Current Icing Product
  - Forecast Icing Potential
  - National Conv. Wx Diagnostic/Forecast



# SIGMETs

(**SIG**nificant **MET**eorological Information)

Weather potentially hazardous to all aircraft



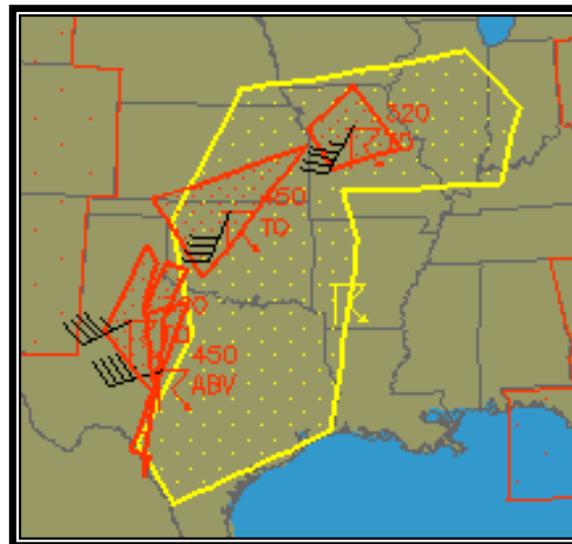
WSUS1 KCHI 041621  
CHIU WS 041615  
SIGMET UNIFORM 2 VALID UNTIL 042015  
SIGMET ND SD MN WI  
FROM FAR TO RHI TO DLL TO ODI TO 30S  
FSD TO 65NW ANW TO DPR TO 60S BIS TO  
FAR  
OCNL SEV TURB BTN FL240 AND FL390.  
RPRTD BY BE40 AND LJ25. THIS UPDATES  
UNIFORM 1 AND EXTENDS AREA INTO WI.  
CONDS CONTG BYD 2015Z.  
JNR

- Advises Flight Crew of non-thunderstorm weather (severe icing, severe turbulence, volcanic ash, and dust storms) potentially hazardous to all aircraft.
- Area of responsibility: CONUS and coastal waters
- **Average 500+ Annually**



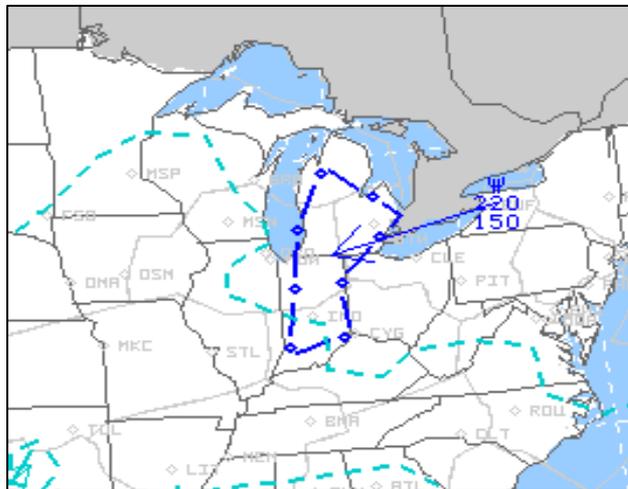
# Convective (Thunderstorm) SIGMET

- Advises Flight Crews of significant areas of thunderstorms and associated hazards (turbulence, icing, wind shear).
- Area of responsibility:  
CONUS + coastal waters
- Issued Hourly / Valid for 2 hrs
- **Average 30,000+ Annually**



WSUS41 KMKC 041856  
WSTC  
SIGMET CONVECTIVE SIGMET 85C  
VALID UNTIL 2055Z  
TX OK  
FROM 60SE GAG-50WSW SPS-60NE JCT-  
50SSE DLF INTSF LINE SEV TS 40 NM  
WIDE MOV FROM 25045KT. TOPS ABV  
FL450. TORNADOES...HAIL TO 2 IN...WIND  
GUSTS TO 80KT POSS.

OUTLOOK VALID 042055-050055  
FROM ORD-FWA-LOU-SGF-LIT-LCH-LRD-  
50E DLF-30W ADM-GAG-OVR-ORD REF  
WW 22 23.  
WST ISSUANCES EXPD.



# AIRMETS

- Advises Flight Crews of non-thunderstorm weather (moderate icing, moderate turbulence, widespread areas of low ceilings and visibility, mountain obscurations, strong surface wind), but that does not meet SIGMET criteria..
- Area of responsibility: CONUS and coastal waters
- **Average 28,000+ Annually**

WAUS1 KBOS 042032  
BOSS WA 042045  
AIRMET SIERRA UPDT 6 FOR IFR AND MTN  
OBSCN VALID UNTIL 050300  
AIRMET MTN OBSCN...ME NH VT NY PA MA MD  
WV VA  
FROM 70NW PQI TO MLT TO CON TO HAR TO  
30NW GSO TO HMV TO HNN TO JHW TO SYR  
TO MSS TO YSC TO 70NW PQI  
MTNS OCNL OBSC IN CLDS/PCPN/BR. CONDS  
CONTG BYD 03Z THRU 09Z.





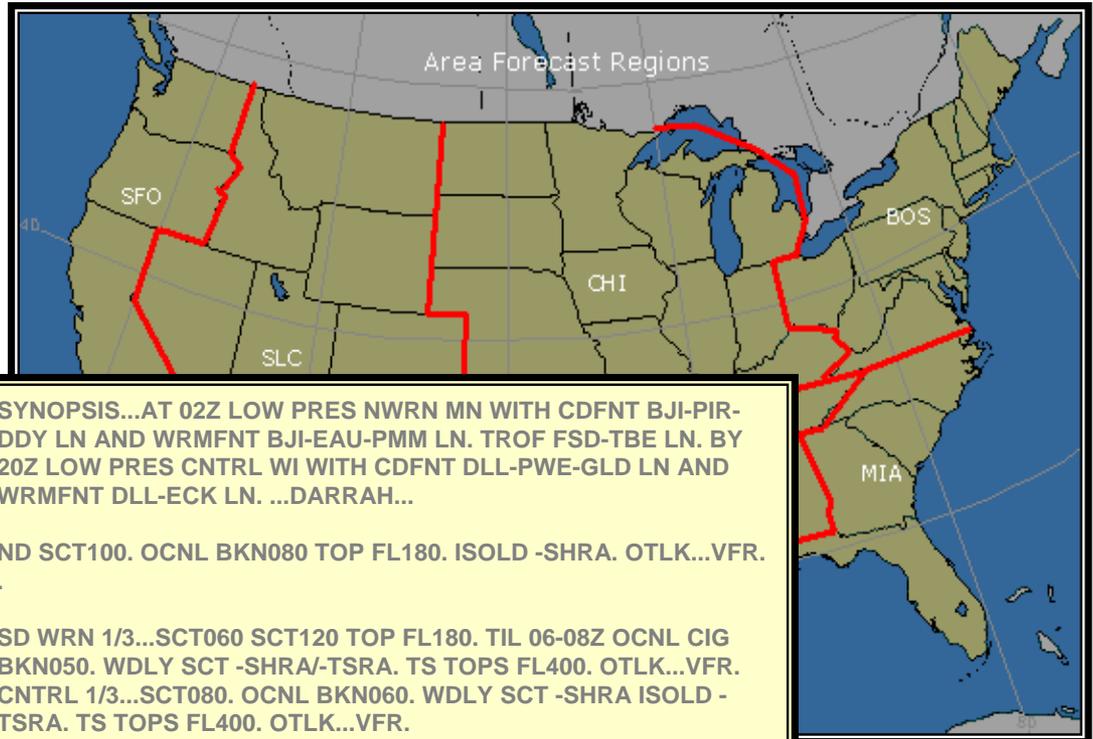
# Area Forecasts

WEST

CENTRAL

EAST

- Weather Forecasts for General Aviation Pilots.
  - Clouds
  - Visibility
  - Thunderstorms
  - Rain/Snow/Fog
  - Wind



SYNOPSIS...AT 02Z LOW PRES NWRN MN WITH CDFNT BJI-PIR-DDY LN AND WRMFNT BJI-EAU-PMM LN. TROF FSD-TBE LN. BY 20Z LOW PRES CNTRL WI WITH CDFNT DLL-PWE-GLD LN AND WRMFNT DLL-ECK LN. ...DARRAH...

ND SCT100. OCNL BKN080 TOP FL180. ISOLD -SHRA. OTLK...VFR.

SD WRN 1/3...SCT060 SCT120 TOP FL180. TIL 06-08Z OCNL CIG BKN050. WDLY SCT -SHRA/TSRA. TS TOPS FL400. OTLK...VFR. CNTRL 1/3...SCT080. OCNL BKN060. WDLY SCT -SHRA ISOLD -TSRA. TS TOPS FL400. OTLK...VFR.

ERN 1/3...SCT100. BY 05-07Z OCNL BKN080 TOP 160. OTLK...VFR SHRA. .

NE PNHNDL...AGL SCT050. TIL 04-06Z ISOLD -SHRA/TSRA. TS TOPS FL400. OTLK...VFR.

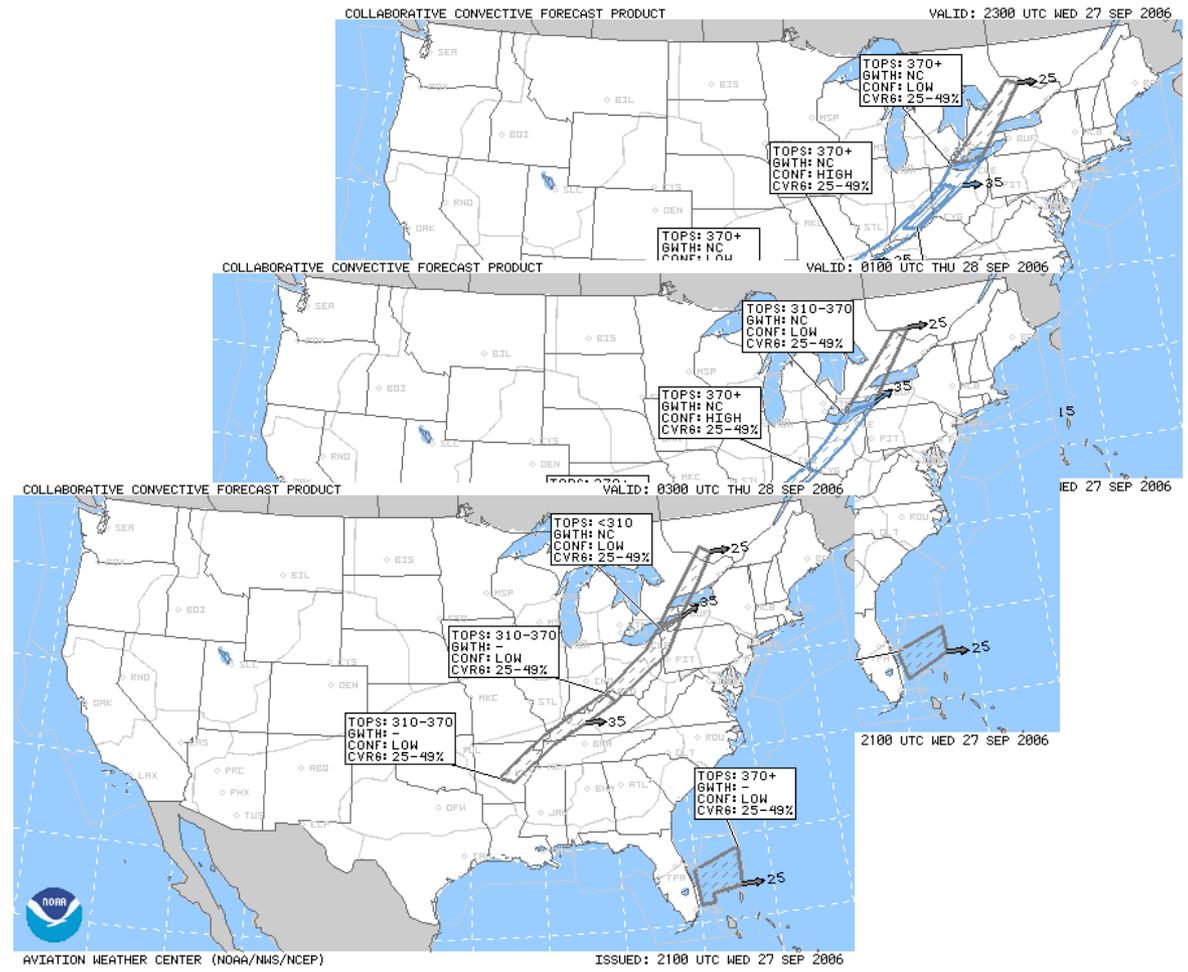
CNTRL AND E...AGL SCT040 BKN080 TOPS LYRD FL180. OCNL CIG OVC030. WDLY SCT -SHRA/TSRA. TS TOPS FL450. TS POSS SEV.

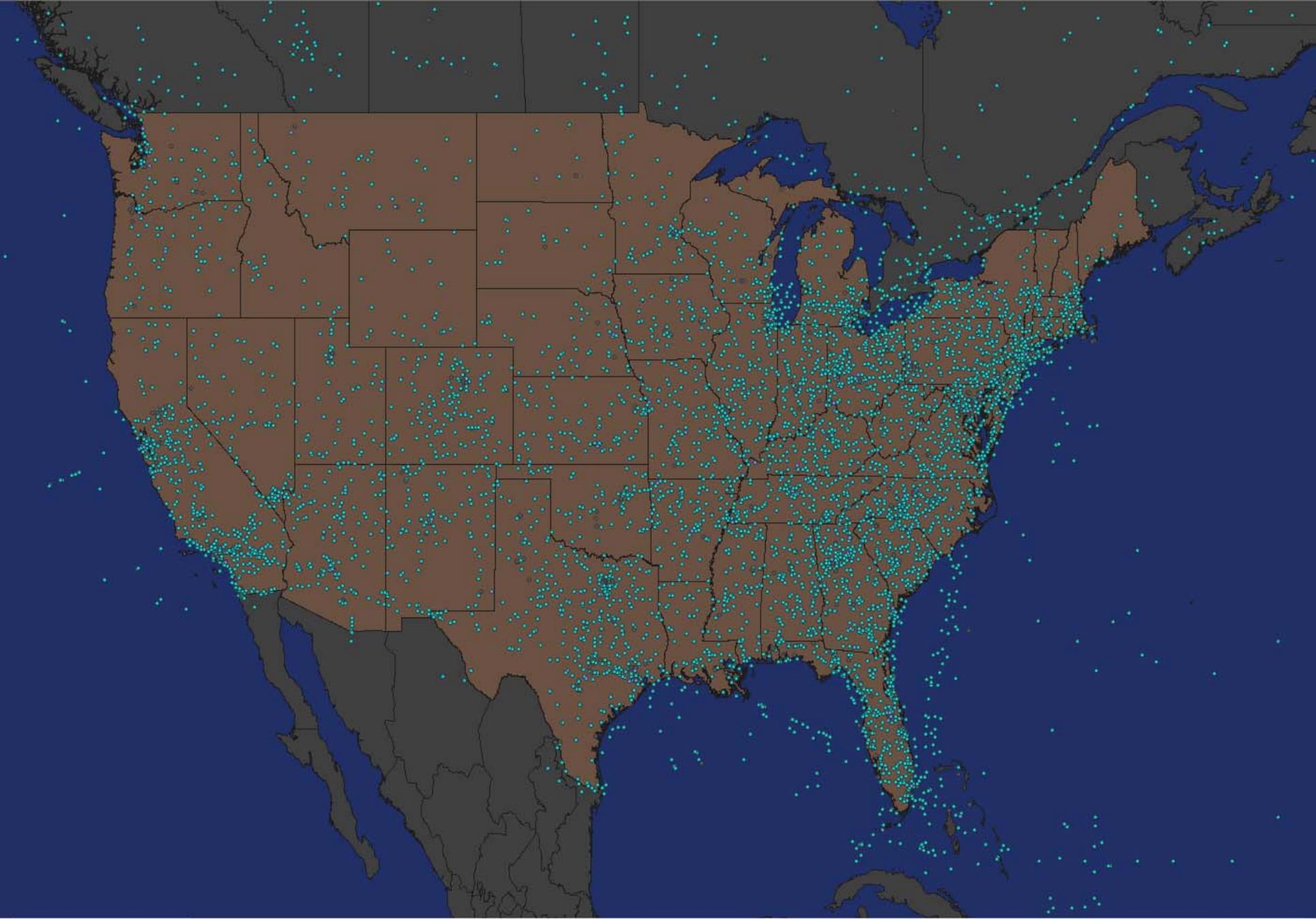
CNTRL BY 06-08Z SCT030 OCNL CIG BKN020. CONDS SPRDG ACRS RMNDR BY 11-13Z. OTLK...VFR. .



# Collaborative Convective (thunderstorm) Forecast Product (CCFP)

- 9<sup>th</sup> Season
- Issued every 2 hours
  - 2, 4, 6 h forecasts
- Strategic traffic flow management
- Collaborators:
  - *MSC*
  - *ATCSCC*
  - *Meteorologists at CWSUs, Airlines, & AWC*

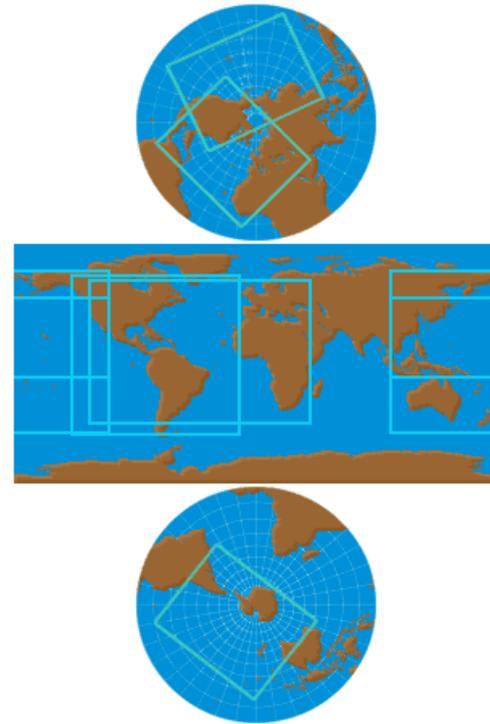






# International Forecasts

- World Area Forecast Center (WAFC)
- Meteorological Warning Office
- Gulf of Mexico and Caribbean
- International Flight Folders



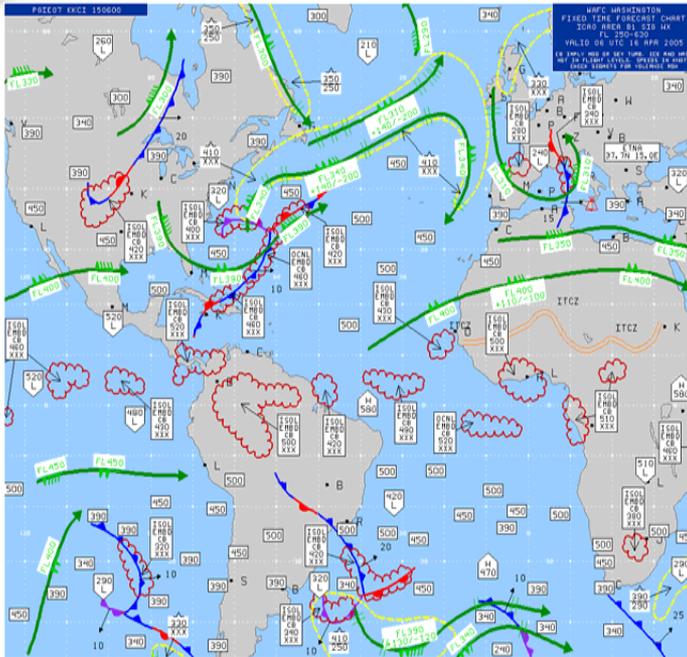


# World Area Forecast Center

- World Area Forecast System
  - Developed by International Civil Aviation Organization (ICAO) and the World Meteorological Organization to improve the quality and consistency of enroute guidance provided for international aircraft operations.
- Supported by Two World Area Forecast Centers (WAFCs).
  - WAFC – Washington (KC and DC)
    - AWC provides Significant Weather Maps
    - NCEP Central Operations Provides Wind and Temperature Grids Charts
    - NWS Telecommunications Gateway supports satellite data broadcasts
  - WAFC – London
    - Met Office -- Exeter
  - Each Center provides backup for each other.



# Significant Weather Forecasts



24 hour forecasts of:

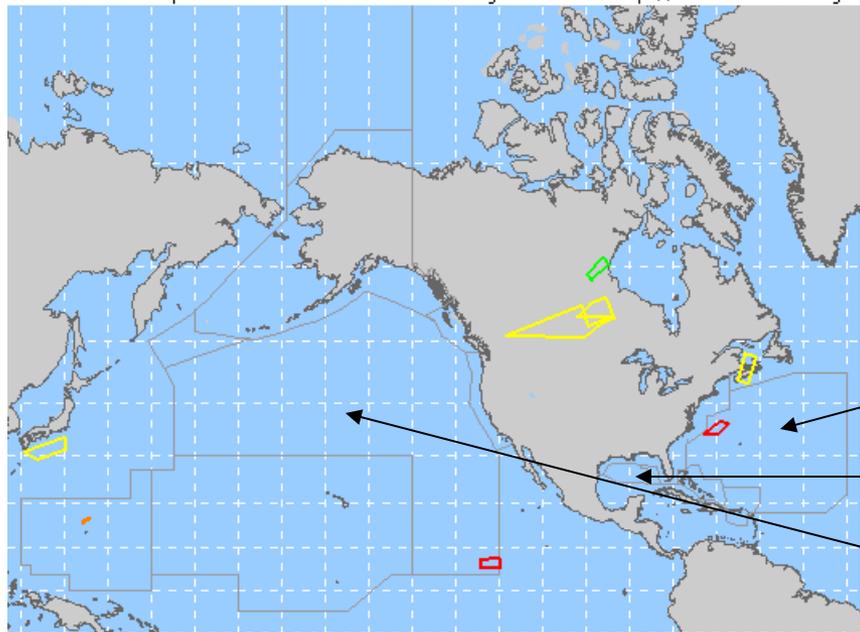
- Jet Streams,
  - Thunderstorms,
  - Turbulence,
  - Tropopause Heights
  - Fronts
  - Active Volcanoes
  - Tropical Cyclones
- Covers FL250 - FL600
  - Issued every 6 hours
  - Worldwide forecast



# Oceanic SIGMET

- Thunderstorms
- Tropical cyclone (Hurricanes)
- Severe icing and turbulence
- Dust storms and sandstorms
- Volcanic Ash

2051 UTC Fri 15 Apr 2005 International Sigmet <http://aviationweather.gov>



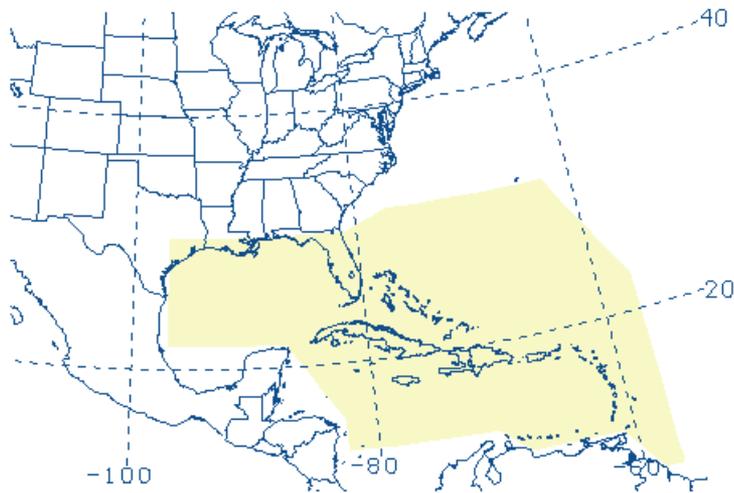
Atlantic,  
Gulf,  
Pacific

WSNT10 KKCI 051409  
SIGA0J  
TJZS SIGMET JULIETT 1 VALID  
051405/052005 KKCI- SAN JUAN FIR  
VOLCANIC ASH FROM SOUFRIERE  
HILLS WI 20 NM EITHER SIDE OF LINE  
1618N06300W 1550N06345W. TOPS TO  
FL070. ASH MOV SW 25KT. NC. BASED  
ON SATELLITE OBS AND LATEST  
ADVSRY. OUTLOOK 06/0205..NC.  
TANSEY



# Gulf of Mexico and Caribbean

- Weather Forecasts for General Aviation Pilots.
  - Clouds
  - Visibility
  - Thunderstorms
  - Rain/Snow/Fog
  - Wind





# Gulf of Mexico Area Forecasts



- Weather Forecasts for Helicopter Operations.
  - Clouds
  - Visibility
  - Thunderstorms
  - Rain/Fog
  - Wind
- 4,000 Operating Oil Platforms
- 30,000 personnel living on the oil platforms
- 600 Helicopters
- 1.3 Million flights in 2005



# International Flight Folder Documentation Program (IFFDP)

United States (AWC) responsible for:

Supplying operators and flight crews with meteorological information for scheduled int'l flights departing from the US.

Used for:

- dispatch planning
- flight crew pre-flight brief
- flight crew en-route brief

Average 60,000 pages faxed per month.

NOAA's National Weather Service  
Aviation Weather Center

Home News

Local forecast by "City, St" or Zip Code  
City, St  Go

Advisories  
SIGMET/AIRMET »  
Center Weather

Forecasts  
Convection »  
Turbulence  
Icing  
Winds/Temps »  
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### International Flight Folder Documentation Program [FYI/Help](#)

#### Product Menu

CHARTS

- [HWD/RADAR Summary](#)
- [Volcanic Eruptions](#)
- [Significant Weather \(SIGWX\)](#)

Canadian Graphical Area Forecasts

[Clouds and Wx](#) [Ice and Turb](#)

#### Wind and Temperature

Area	LAT/LON
A	65N-50S 120W-25W (Americas)
B1	50N-40S 125W-25E (AMERS-AFR)
C	76N-45S 65E-31W (Europe-Africa)
D	65N-28S 133E-15W (Asia)
E	45N-47S 180E-24E (Asia-Australia)
F	45N-45S 105E-100W (Pacific)
G	Centered on 75E (Asia)
H	Centered on 45W (North Atlantic)
I	Centered on 155W (North Pacific)
J	Centered on 142W (South Pole)
M	70N-10S 100E-110W (Pacific)

TEXT LISTS

- [Aerodrome Forecasts \(TAF\)](#)
- [Aerodrome Reports \(METAR & SPECI\)](#)
- [SIGMETs \(International Destinations\)](#)
- [SIGMETs \(Oceanic FIRs\)](#)
- [SIGMETs \(United States\)](#)
- [Miscellaneous Area Forecasts](#)
- [U.S. Domestic AIRMETs](#)
- [Tropical Cyclone Forecasts](#)
- [Volcanic Eruptions](#)

OTHER

- [Document Catalog \(html / pdf\)](#)
- [Current Conditions](#)

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To request a product from our automated fax back system, call toll free: (877) 808-2203. To speak with an operator, call our 24-hour help desk: (877) 280-2811; FAX: (816) 880-0115/0139.



# Aviation Support Branch

- Major Responsibilities
  - Automated Product Issuance
  - Product Delivery Services
  - Production Systems
  - Applied Research
  - Technical Training
  - Verification
  - Facilities





# Applied Research

- Partner with FAA's Aviation Weather Research Program (AWRP)
- Aviation Weather Technology Transfer (AWTT) process
  - Disciplined technology transfer process
  - Joint FAA and NWS approval board
  - User Meetings
- AWC responsible with implementation of research as operational products

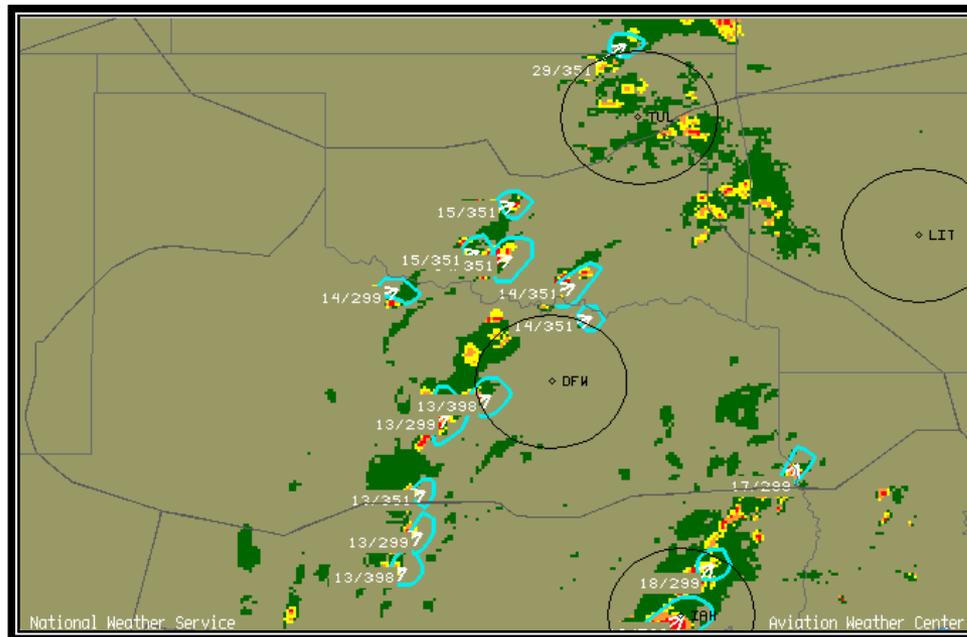




# National Convective Weather Forecast (NCWF)

- Operational since Fall 2001
- NCWD: Current Convective Hazards
- NCWF: 1 h extrapolation forecasts of thunderstorm hazards
- Incorporates WSR-88D, VIL, echo top, and lightning data
- Uses stratiform-convective partitioning & elliptical filter

Forecasts mature, large-scale storms well. Forecasts isolated or short-lived systems not as well.

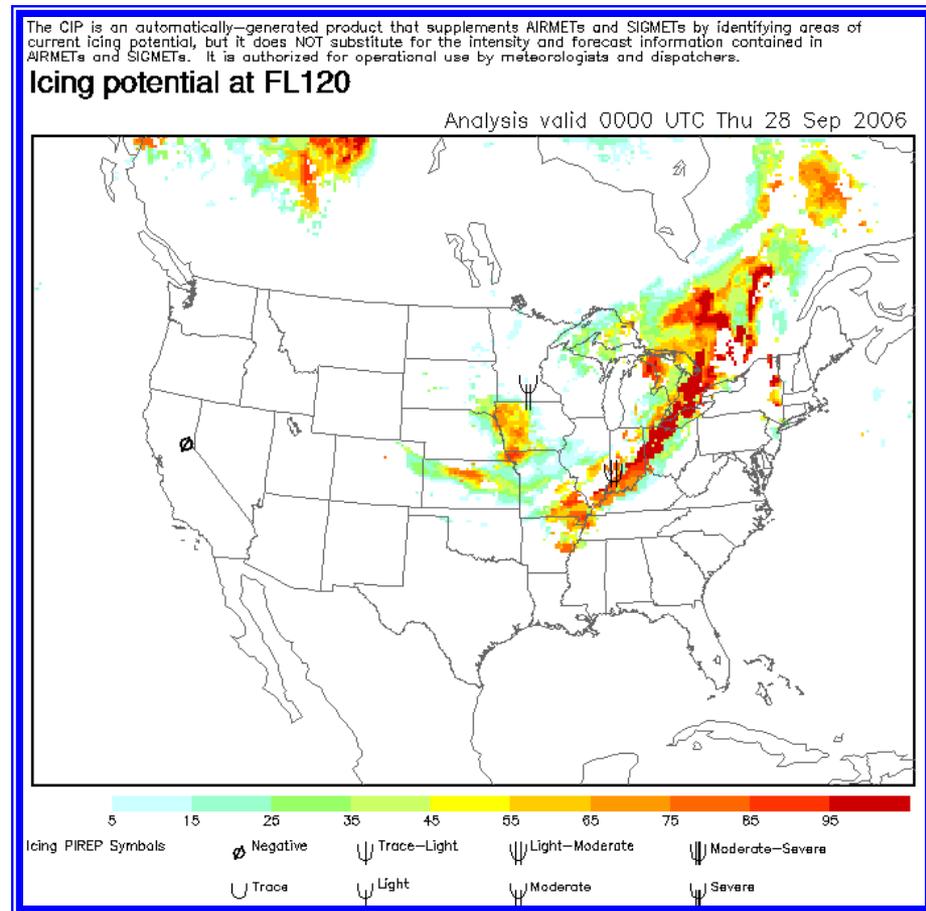


NCWF-2 Upgrade will include thunderstorm probability out to 2 hours



# Forecast Icing Potential (FIP)

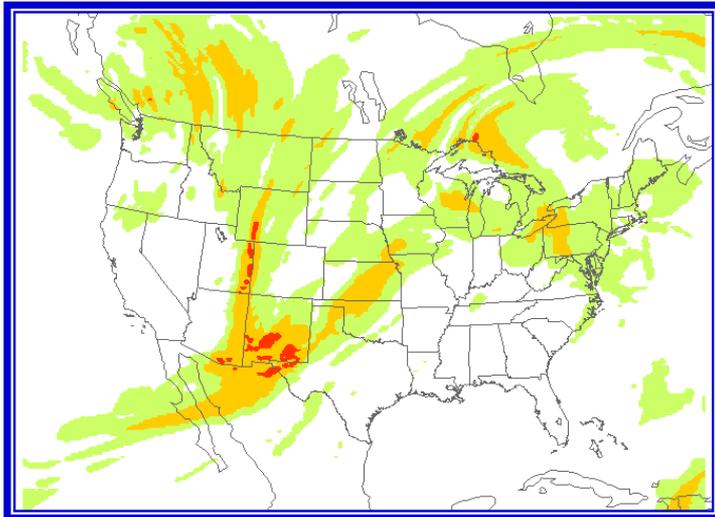
- Operational since winter 2004
- Gridded Forecast of Potential Icing
- High resolution (RUC 20 km)
- Incorporates RUC model to produce interest maps for:
  - Temperature
  - Cloud top temperature
  - Relative Humidity
  - Vertical Velocity
  - Precipitation Rate
- Does Not represent Icing Severity





# Graphical Turbulence Guidance (GTG)

- **Operational since spring 2003**
- **Automated Product showing Location and Intensity of Turbulence**
- **Incorporates RUC 20 km, lightning data, and PIREPs to map turbulence intensity**
- **Assigns weighting functions to several operationally verified algorithms and combines them to produce the GTG product**



Valid Times:

+0h, +3h, +6h, +9h, +12h





# ADDS Web Site

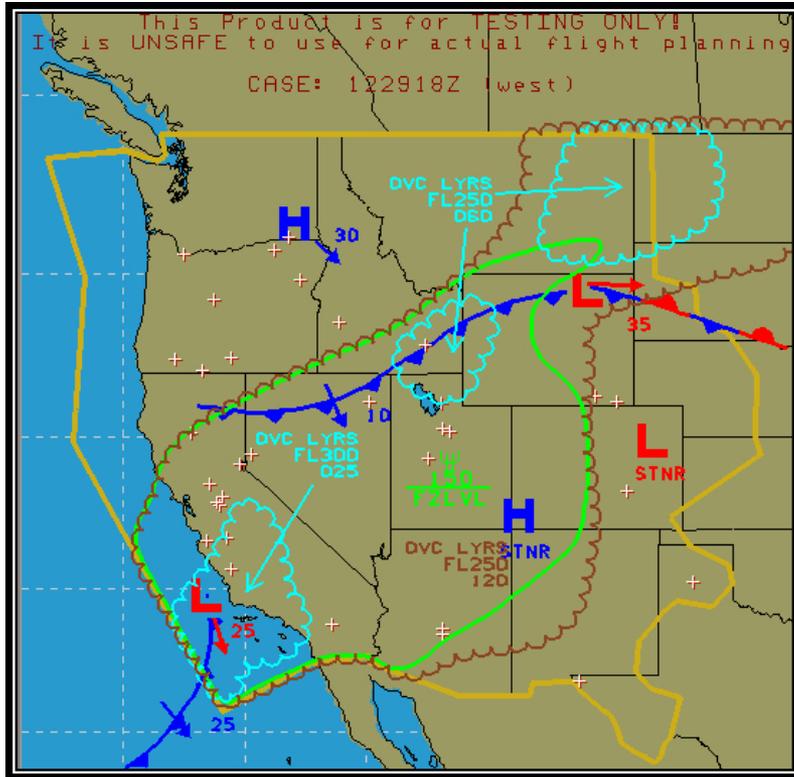
- Aviation Digital Data Service (ADDS)
- Developed by NCAR (AWRP funding)
- Operational 2003
- Averaging nearly 10 million hits per day
- <http://adds.aviationweather.gov>



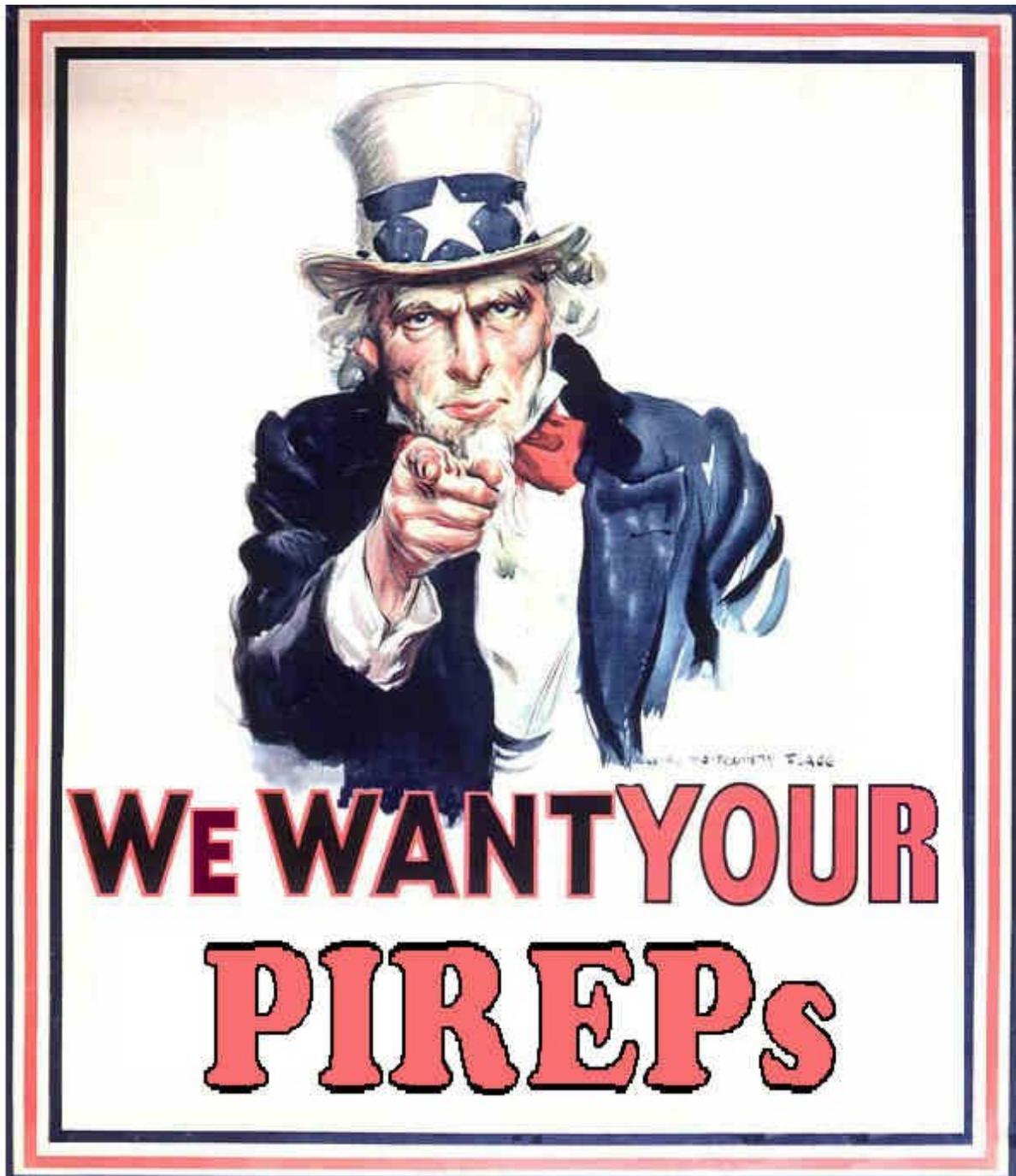


# Graphical Area Forecast

- Currently in development
- Will replace FAs and AIRMETs
- Graphically and textually depicts:



- IFR Ceilings
- IFR Visibility
- MVFR
- Clouds
- Thunderstorms
- Freezing Levels
- Mountain Obscuration
- Mountain Wave Turbulence
- Icing
- Turbulence
- Winds >25 kts
- LLWS
- SIGMETs





# Aviation Weather Center



- Thank you
- Questions?