FAA Aviation Weather Division Overview

Presented to: **Fall 2023 FPAW Meeting**

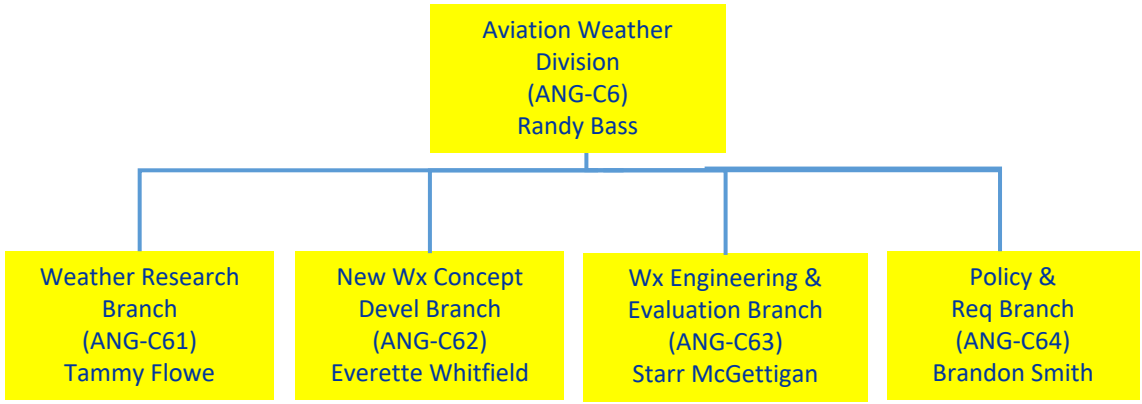
By: **Office of NextGen, Aviation Weather Division (ANG-C6)**

Date: **15 Nov 2023**

Federal Aviation Administration

Aviation Weather Division

- Mission: Assure the development, enhancement, dissemination, and integration of productive weather information into Air Traffic Management decisions by pilots, controllers, flight operations and airport operators
- Four branches comprise the division
  - Weather Research Branch: Conducts research to mitigate the impact of weather on aviation by transitioning the research to operations
  - New Weather Concept Development Branch: Bridges the gap between available and/or emerging weather products and services with operational weather requirements for Air Traffic Managers Decision Support Processes/Decision Support Tools through weather integration
  - Weather Engineering and Evaluation Branch: Provide engineering, evaluation, and technical services to support aviation weather initiatives. Capabilities include weather system and user laboratories as well as Airport Operations Area testbeds
  - Policy and Requirements Branch: Identifies and coordinates domestic and international weather requirements



Aviation Weather Division

- FAA is the U.S. Meteorological Authority for aviation weather
  - ANG-1 is designated lead, delegates representation down to AWD
  - Represents U.S. on international coordination/harmonization activities including ICAO

Collaboration with internal and external partners and stakeholders is key

- AJM-3, AJV-S, AVS, AJR-B, NATCA, etc.
- Airline, commercial weather providers
- National Weather Service, NASA, DoD, DOE
- National labs, universities, private industry

ANG-C6 conducts a variety of applied research in weather-related areas

- Phenomena-based: Turbulence, icing, convection, cloud ceiling and visibility, space weather, volcanic ash
- Program-based: Observing sensors, numerical weather models, weather radar, UAS/AAM, weather in the cockpit, standards and guidelines, user education

Current Research Program Areas

- **Convective Storms (CS)**
- **Inflight Icing (IFI)**
- **Turbulence (TRB)**
- **Model Development & Enhancement (MDE)**
- **Clouds, Cloud Ceiling, & Visibility (C&V)**
- **Advanced Weather Radar Techniques (AWRT)**
- **Unmanned Aircraft System Weather (UAS Wx)**
- **Terminal Area Icing Weather Information for NextGen (TAIWIN)**
- **High Ice Water Content (HIWC)**
- **Quality Assessment (QA)**
- **Aviation Weather Demonstration & Evaluation (AWDE) Services**
- **Weather Observations (Wx OBS)**
- **Volcanic Ash Detection (VAD)**
- **Space Weather Aviation (SWxA)**

Staff and Research Partners

People:

- Program Manager
- 14 Subject Matter Experts

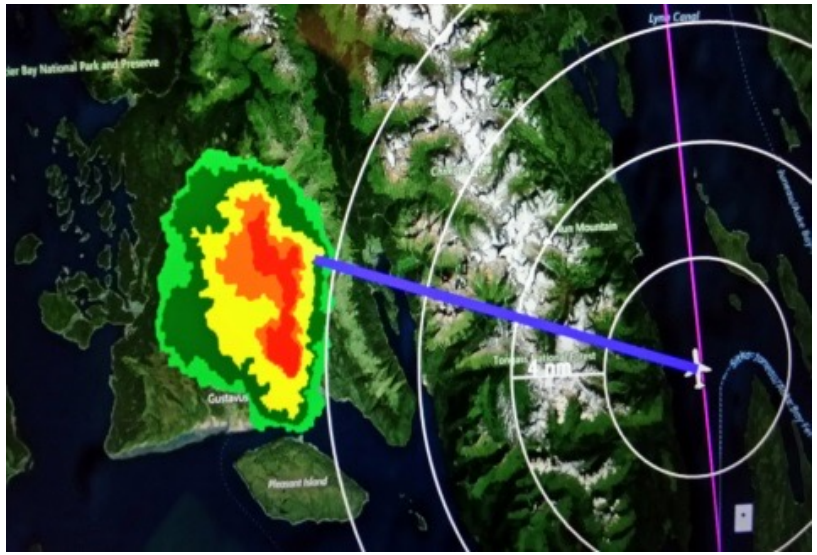
Laboratories:

- NOAA GSL — Model Development & Enhancement (MDE); Quality Assessment (QA)
- NOAA NSSL — Advanced Wx Radar Techniques (AWRT); Terminal Area Icing Weather Information for NextGen (TAIWIN)
- NOAA NCEP — MDE; Clouds, Cloud Ceiling, and Visibility (C&V); In-Flight Icing (IFI); Turbulence (TRB); Convective Storms (CS)
- NWS MDL — C&V
- MIT/LL — CS; C&V
- NCAR — IFI; MDE; C&V; TRB; CS; TAIWIN, High Ice Water Content (HIWC); Weather Observations (Wx Obs)
- WJHTC — Aviation Weather Demonstration and Evaluation (AWDE); Wx Obs; TAIWIN; HIWC
- MITRE CAASD — Unmanned Aircraft System Weather (UAS Wx); Space Weather Aviation (SWxA); TRB
- NRC — TAIWIN
- ECCC — TAIWIN
- Diakon — TAIWIN
- NASA — TAIWIN; HIWC

Weather Research Branch (ANG-C61)

Conducts research to mitigate the impact of weather on aviation by transitioning the research to operations

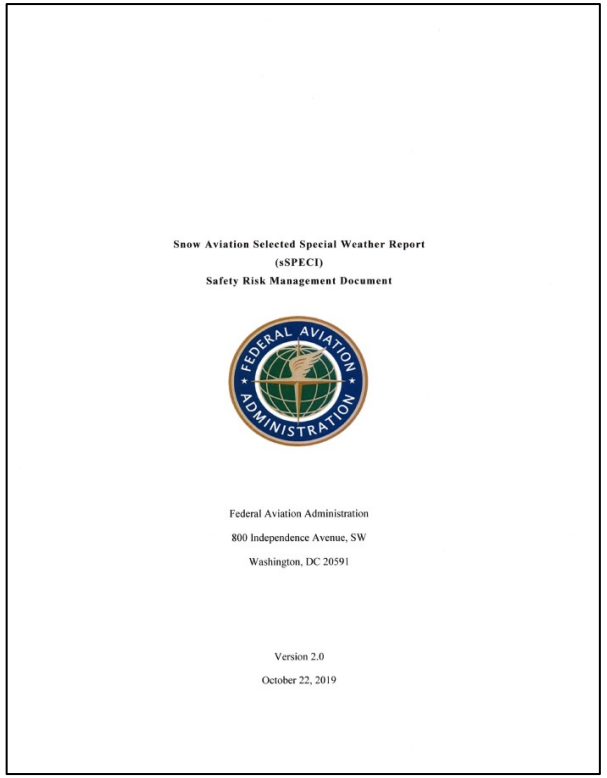
- Core Functions:
  - Manages Aviation Weather Research Program
  - Manages Weather Technology in the Cockpit (WTIC) Program
    - WTIC PLA
  - Coordinates research with other Federal agencies
  - Transitions technologies (R2O)



New Weather Concept Development Branch (ANG-C62)

Bridges the gap between available and/or emerging weather products and services with operational weather requirements for Air Traffic Managers Decision Support Processes/Decision Support Tools (DSPs/DSTs) through weather integration

- Core Functions
  - Leads weather integration initiatives for DSPs/DSTs
  - Manages contract vehicle awards & initiatives
  - Generates & processes procurement requests
  - Tracks division's budgetary allocations
  - Manages division's Safety Risk Management initiatives
  - Coordinates & aggregates FAA’s inputs for Office of the Federal Coordinator for Meteorology annual updates
  - Leads Weather Forecasting Improvement (WFI) PLA


Snow Aviation Selected Special Weather Report
(sSPECI)
Safety Risk Management Document

Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Version 2.0
October 22, 2019

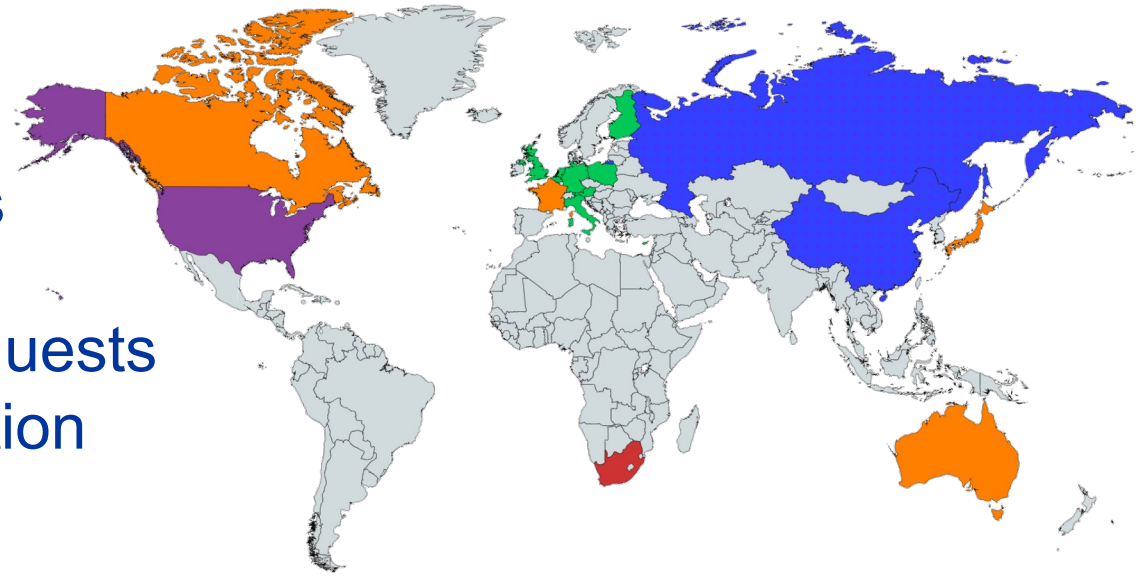
Weather Engineering and Evaluation Branch (ANG-C63)

Provide engineering, evaluation, and technical services to support aviation weather initiatives. Capabilities include weather system and user laboratories as well as Airport Operations Area testbeds.

- Core Functions:
  - Conducts Aviation Weather Demonstrations and Evaluation
    - Coordinates Quality Assessments of recent research
    - Partners with users to test and evaluate new products & tools
  - Integrates new technologies into the NAS for all users and stakeholders with NextGen Weather Processor/Common Support Services-Weather
    - Test & Evaluation support for baseline system
    - Program Management for Enhancements 1 package
  - Leads engineering support for RVR program
  - Leads Weather Observation Improvements (WOI) PLA

Policy and Requirements Branch (ANG-C64)

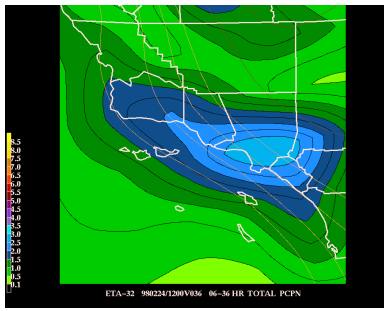
Identifies and coordinates domestic and international weather requirements



- Core Functions:
  - Collaborates with international partners to develop weather requirements
  - Entry point for new weather service requests
  - Leads Weather Information Modernization and Transition
    - Stakeholders coordination for future aviation weather capabilities
    - Looking for ways to streamline product suite and promote consistency
  - Leads ATM Weather – Weather Transition PLA

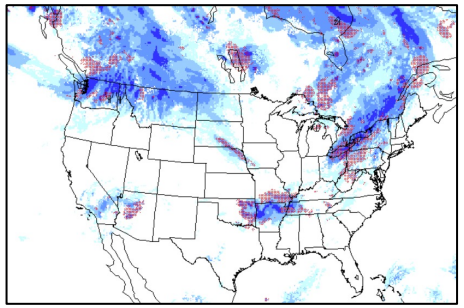
FAA Weather Research History of Success

1998: 40KM; 2002: 20KM; 2005: 13KM



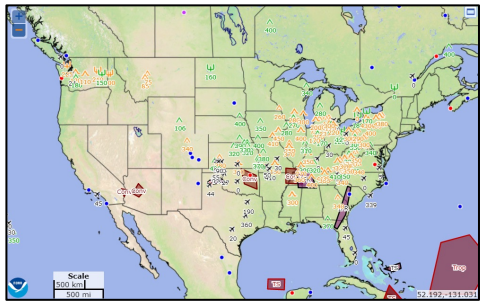
Rapid Update Cycle (RUC)

2002: CIP; 2004: FIP; 2011: FIP Severity; 2012: CIP/FIP RAP; 2014



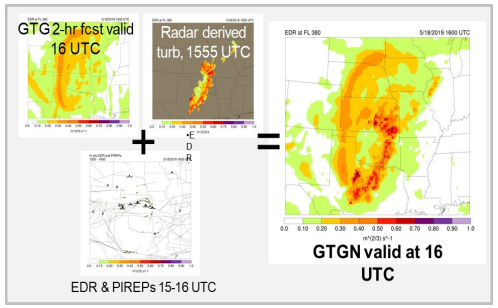
Icing Forecasts

2003: Aviation Digital Data Service (ADDS); 2016: aviationweather.gov



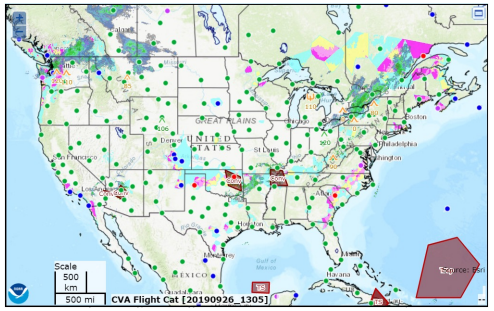
Web-based Products

2003: GTG; 2010: GTG2 (Mid-Levels); 2015: GTG3 (MtnWv & Low Lvl); 2019: GTG-N (Pseudo-operational)



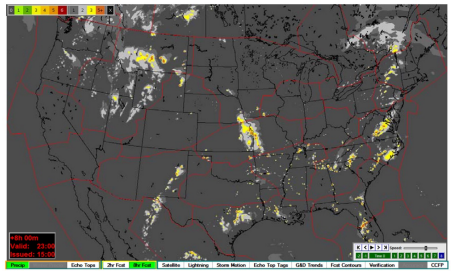
Turbulence Forecasts

2007: Experimental ADDS
2015: Operational ADDS
2020: HEMS Upgrade



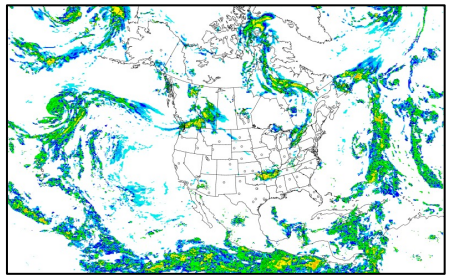
Helicopter Emergency Medical Services (HEMS) Tool and the National Ceiling and Visibility Analysis

2010 live demo; 2012 transition to ATO



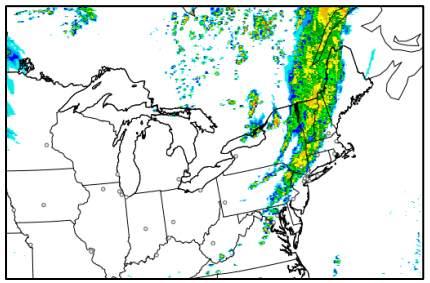
CoSPA, 0-8 hour high resolution storm prediction

2012; Updated 2014, 2016, 2018, 2020



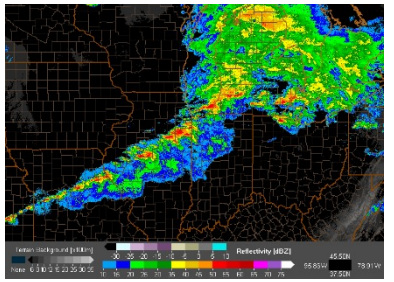
Rapid Refresh (RAP)

2014; Updated 2016, 2018, 2020



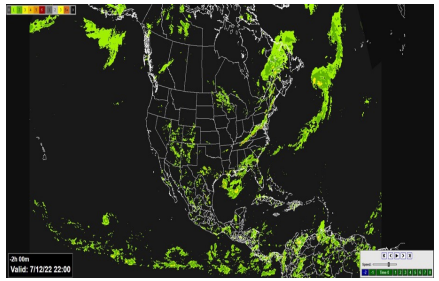
High-Resolution Rapid Refresh (HRRR)

2014; Updated 2016, 2018, 2020, 2022



Multi-Radar, Multi-Sensor (MRMS)

2017; 2021: Domain Expansion, Forecast Capability

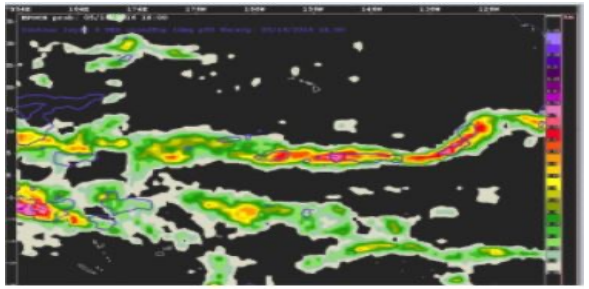


Offshore Precipitation Capability (OPC)

Federal Aviation Administration

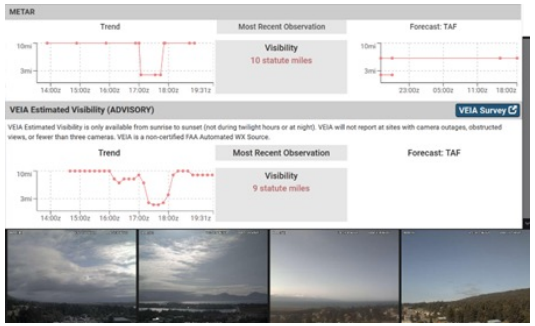
FAA Weather Research History of Success

2023



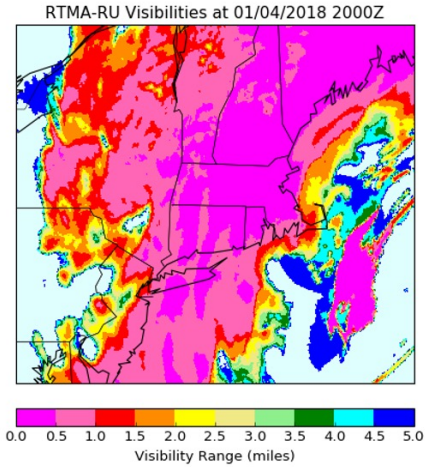
Ensemble Prediction of Oceanic Convective Hazards (EPOCH)

2020 live demo; 2022 transition to Weather Camera Program



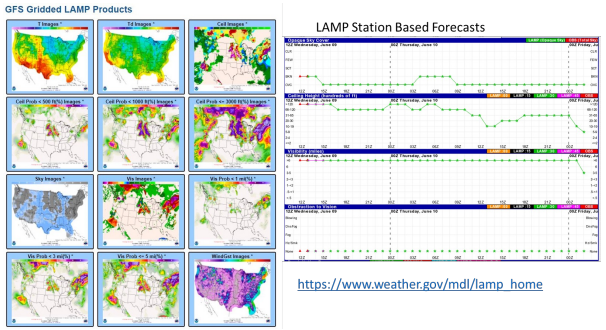
Visibility Estimation through Image Analytics (VEIA)

2017 initial release (v2.6); 2018 upgrades (v2.7); 2020 upgrades (v2.8)



RTMA Rapid Update for C&V

2017 v2; 2018-2021(v2.1- v2.3)



https://www.weather.gov/mdl/lamp_home

Localized Aviation Model Output Statistics Program (LAMP) C&V upgrades

2007 prototype; 2012 operational

Latest Anemometer Observations

Station	Elev	Time (UTC)	Average Dir / Speed	Peak Speed	Temp (F)
Eaglecrest	2625 ft	18:41	110 / 15	18	1830
Mt Roberts	1762 ft	18:41	140 / 09	11	37
Sheep Mtn	3543 ft	18:41	130 / 13	19	32
Center Field	33 ft	18:41	110 / 11	13	NA
Pederson Hill	492 ft	18:41	090 / 10	13	NA
Runway 08	33 ft	18:41	090 / 16	18	NA
Runway 26	33 ft	18:41	100 / 13	14	NA

Elevations in Feet MSL, Direction in Magnetic, Speed in knots

Runway Winds

Runway	Head Wind	Cross Wind
8	9	6
26	-9	6

Speed in knots

JAWS Turbulence Alerts

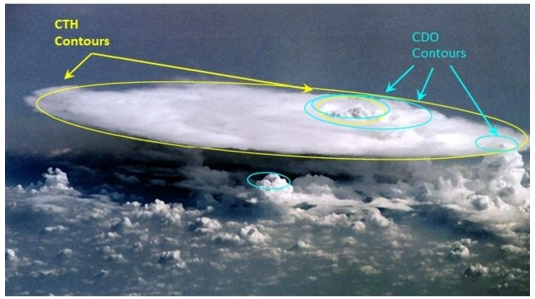
08A 26D	NONE
LMNCREEK	NONE
DOWNWIND	NONE
GAST 5-2	NONE
GAST 2-6	NONE
8HIGH	NONE

Latest Profiler Wind Observations

Elevation	North Douglas	Lemon Creek	South Douglas
5800 ft	NA / NA	120 / 17	130 / 13
5400 ft	NA / NA	110 / 17	120 / 13
5000 ft	130 / 17	110 / 17	110 / 14
4600 ft	120 / 16	100 / 16	110 / 14
4200 ft	120 / 15	090 / 15	110 / 14
3800 ft	110 / 14	090 / 14	110 / 14
3400 ft	110 / 12	090 / 12	120 / 15
3000 ft	110 / 11	080 / 10	110 / 17
2600 ft	100 / 10	080 / 10	110 / 18
2200 ft	090 / 10	090 / 11	110 / 17
1800 ft	080 / 11	090 / 11	110 / 15
1400 ft	070 / 12	100 / 11	110 / 13
1000 ft	070 / 13	110 / 12	110 / 10
600 ft	070 / 14	110 / 15	120 / 07

Elevations in Feet MSL, Direction in Magnetic, Speed in knots

Juneau Airport Wind System (JAWS)



Remote Oceanic Meteorology Information Operational (ROMIO)

Questions???

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