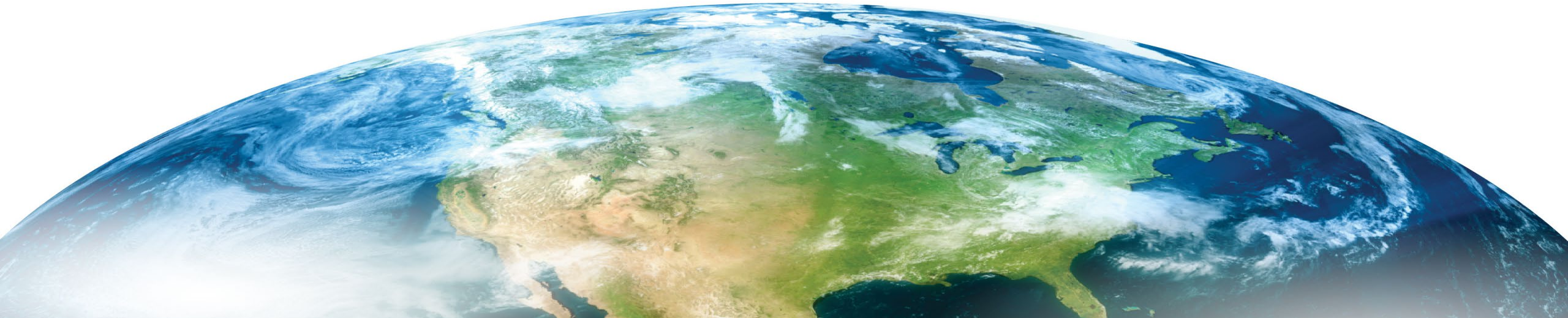
REDAC / NAS Ops

Review of FY 2022 Proposed Portfolio

Randy Bass, ANG-C6

Date: March 24, 2020



Weather Program
A11.j

What are the benefits to the FAA

- Enhanced NAS safety via reduction of accidents associated with hazardous weather
- Improved NAS capacity/efficiency via reduced delays and cancellations and increased capacity in high traffic areas
- Reduction in environmental impact (i.e. lower fuel consumption via improved accuracy and accessibility of observed and forecast weather information)
- Enhanced GA safety via improved accuracy and accessibility of observed and forecast weather information

What determines program success

- Transition of research capabilities into evolving ATM decision support processes
- Research capabilities align with NSIP and NextGen emerging solution sets
- Incorporation by NWS of research capabilities to improve delivery of FAA required services
- Incorporation by NWS of research capabilities into weather information that is enhancing GA safety

Weather Program A11.j
Overview Capabilities

People:

- Program Manager and 11 Project Leads/Subject Matter Experts

Laboratories:

- NOAA ESRL – Numerical Wx Modeling (NWM), Quality Assessment, Terminal Area Icing Weather Information for NextGen (TAIWIN), Ceiling & Visibility (C&V)
- NOAA NSSL – Wx Radar Techniques, TAIWIN
- NOAA NCEP – NWM, C&V
- NWS MDL – C&V
- MIT/LL – Convective Storms, C&V, Weather Observations (Wx OBs)
- NCAR – In-flight Icing, Turbulence, Convective Storms, C&V, NWM, TAIWIN, High Ice Water Content (HIWC), Wx OBs
- FAA Tech Center – Aviation Weather Demonstration and Evaluation (AWDE), Wx OBs
- NRC – TAIWIN
- ECCC – TAIWIN
- Diakon – TAIWIN
- NASA – HIWC, TAIWIN
- Australian BoM – HIWC
- Metron Aviation, Inc. – Turbulence

Weather Program– Accomplishments in Current FY (20)

- **Convective Weather:** Completed redesign of the Ensemble Prediction of Oceanic Convective Hazards (EPOCH) operational algorithm. Defined an expanded domain for Offshore Precipitation Capability (OPC) for display on the OPC shadow web site which leverages the Global Synthetic Weather Radar effort of the US Air Force. Updated Convective Weather Avoidance Model (CWAM) to use the inputs of VIL and echo tops in a Convolutional Neural Network (CNN) model (The CNN allows for evaluation of other weather factors in the avoidance model).
- **Turbulence:** Updated Graphical Turbulence Guidance (GTG) with improved calibration for high resolution (3-km) enhancement delivered to the United Kingdom Met Office. GTG-Nowcast (GTGN), a short term, rapidly updated turbulence product, implemented at the National Center for Atmospheric Research (NCAR) for operational user access, pending National Weather Service (NWS) implementation in 2022-2023 timeframe.
- **Ceiling and Visibility (C&V):** Conducted a Safety Risk Management Panel (SRMP) to determine risks associated with enhancements (new gridded analysis, 6-hr forecast, new display controls) to the Helicopter Emergency Medical Services (HEMS) tool; the SRMP approved operational use of the enhanced HEMS tool and the Safety Risk Management Panel Document was signed; Completed analysis of smoke effects for inclusion in the next High Resolution Rapid Refresh (HRRR) weather model enhancement.
- **In-flight Icing:** Completed analysis and recommendations for applying GOES and NEXRAD enhancements for Current Icing Product (CIP). Completed baseline assessment of CIP applied to HRRR showing improvement.

Weather Program– Accomplishments in Current FY (20) (cont'd)

- **Advanced Weather Radar Techniques (AWRT):** Integrated TDWRs monitored for performance on the developmental Multi-Radar Multi-Sensor (MRMS) system. Algorithm for automatically creating convective SIGMET polygons developed. Specific flight levels for composite reflectivity product monitored for performance on the developmental MRMS system.
- **Modeling Development and Enhancement (MDE):** Completed NWS science evaluation and preparation of Northern Hemisphere Rapid Refresh (RAP v5) model and CONUS and Alaska versions of the HRRR v4 for implementation by NWS in 3Q FY20
- **Quality Assessment (QA):** Completed development of Neighborhood Approaches for Verification of Gridded Products; completed data collection for the Icing Product Alaska – Forecast (IPA-F) assessment.
- **AWDE Services:** Completed literature review and briefed space weather ionizing radiation effects on flight crews and passengers. Conducted focus groups and developed final reports to determine operational requirements for a probabilistic turbulence forecast, and to determine the need for additional ceiling observations in Alaska. Conducted a user evaluation and developed a final report for the Icing Product Alaska-Diagnosis (IPA-D) product.
- **TAIWIN:** Completed In-Cloud ICing and Large-drop Experiment (ICICLE) Data Processing Workshop. Preparing for TAIWIN demonstration next winter/spring
- **HIWC:** Supported development of Radar Ice Water Content airborne weather radar algorithm. Completed second year of HIWC Nowcasting Trial. Identified new validation opportunities for Algorithm for the Prediction of HIWC Areas (ALPHA) forecast product.

Anticipated Research in FY21

Planned Research Activities

- **Convective Weather:** Improve OPC, CWAM and the EPOCH capabilities. Incorporate revised algorithms and new data sets to expand domain and incorporate user feedback. Prepare EPOCH for transition to NWS.
- **Turbulence:** Complete GTG High resolution (HRRR-based) Technical Review Panel (TRP) and QA evaluation. Complete GTGN TRP and QA evaluation.
- **C&V:** Conduct an operational demonstration and quality assessment of the Visibility Estimation through Image Analytics (VEIA) algorithm, develop a VEIA confidence value, determine when human input provides value to VEIA, and write an Operational Concept Description for VEIA. Increase the temporal resolution of Localized Aviation Model Output Statistics (LAMP) C&V forecasts and utilize satellite data to improve the performance between the stations. Make improvements to the HRRR C&V through the assimilation of cloud products and post-processing diagnostics of cloud fields. Improve the quality control and display of non-certified weather observations in the HEMS tool.
- **IFI:** Continue development of enhanced CIP and Forecast Icing Product (FIP) using HRRR, GOES, and NEXRAD enhancements and data from the ICICLE field program.
- **QA**: Plan, coordinate, and conduct scientific meteorological assessments of IPA-F, RAP V5 upgrade, HRRR V4 upgrade impact, HRRR-Based CIP & FIP, and GTG.
- **MDE:** Commence experimental runs of Rapid Refresh Forecast System (RRFS) to replace HRRR including a common core with NWS models.
- **AWRT:** Expand MRMS domain to the Western Pacific.

Anticipated Research in FY21 (cont'd)

Planned Research Activities

- **AWDE:** Conduct longer-term evaluation for IPA-D, develop use cases for pilots and dispatchers to support CONOPs development. Conduct research to determine how ensemble forecasts are used, how to visually display the forecasts, and information requirements needed for ensemble forecasts. Participate in the Aviation Weather Center winter and summer experiments. Conduct interviews with airlines to determine concerns and needs regarding radiation effects on flight crew and passengers. Conduct human factor evaluations throughout the development of enhancements for the HEMS product. Conduct user evaluations for OPC, convective weather, C&V, and turbulence products to ensure capabilities are suitable and usable in operational environments.
- **UAS Wx:** Collaborate with FAA UAS community to ensure weather research supports UAS integration into the NAS and aligns with the FAA's vision of weather being a key Focus Area. Determine if on-going weather research for manned operations can be leveraged to support weather capabilities for unmanned operations. Determine Urban Air Mobility weather needs. Identify existing weather capabilities for low altitude operations that may be applicable to UAS operations.
- **TAIWIN:** Demonstrate a TAIWIN capability that identifies and distinguishes between App C and App O icing conditions in the terminal area and perform user evaluation. Begin TAIWIN capability evaluation. Complete ICICLE data processing. Continue icing weather tool analyses using ICICLE datasets to improve the detection and discrimination of freezing drizzle and freezing rain diagnoses and forecasts.
- **HIWC:** Conduct flight campaign in high aerosol ice crystal icing environment. Conduct demonstration evaluation of ALPHA in the U.S. (Tentative).

Anticipated Research in FY21 (cont'd)

Expected Research Products

- **Convective Weather:** EPOCH forecast capability with higher Probability of Detection and lower False Alarm Rate. Tactical CWAM tool for incorporation into NWP. Increased domain (to include Western U.S., Hawaii and Guam) of OPC, mitigate beam blockage issues in Western U.S. through OPC.
- **Turbulence:** High resolution GTG. High resolution GTGN.
- **Ceiling & Visibility:** VEIA operational version. Gridded LAMP C&V forecasts with 15 minute temporal resolution, with improved performance between reporting stations. HRRR with improved C&V fields. HEMS display of non-certified weather observations.
- **In-Flight Icing:** High resolution diagnostic and forecast capabilities.
- **TAIWIN:** Demonstrated TAIWIN capability. Processed ICICLE datasets.
- **AWRT:** 3D radar visualization product that automatically produces convective polygons.
- **MDE:** Developmental version of RRFS.

Emerging FY22 Focal Areas

- **Weather Program:** Emphasis on integration of weather data and information into Decision Support Systems and Services. Transition to operations of successful weather projects into FAA, National Weather Service OR commercial weather provider systems.

- **Convective Weather:** Incorporation of near-term Traffic Flow Management weather requirements.
- **Turbulence:** Development of probabilistic turbulence forecasting techniques. Incorporation of automated turbulence translation technique into traffic flow management decision support processes.
- **C&V:** Viability of a super compact, low energy usage, ceilometer for use in remote areas with data gaps. Operational transition of VEIA. Development of a slant range visibility capability. Translation of C&V information into airport impacts.
- **QA:** Investigation of new techniques and data sources. C&V short-term forecasts. HRRR-based GTG. HRRR-based CIP and FIP. Investigation of techniques for assessment in support of UAS. FV3-based HRRR.
- **AWDE:** User assessments of diagnosis and forecasting products including C&V analysis, turbulence, and convective weather products. Advance AWDE Concept and Product Capability for integration, evaluation and demonstration of future weather concepts and technologies.
- **IFI:** Diagnostic and forecast info in compliance with updated regs and aircraft cert envelopes. Development of capabilities to support UAS operations.

Emerging FY22 Focal Areas (cont'd)

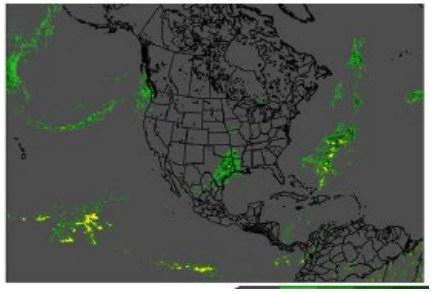
- **TAIWIN:** Assess and validate MET data from NWP models, weather radars, and other data sources with ICICLE research flight data collected. Discrimination between freezing drizzle and freezing rain at surface and aloft in terminal area.
- **HIWC:** Data analysis from FY21 flight campaign.
- **AWRT:** Implement icing and turbulence algorithms into the developmental MRMS system for performance monitoring.
- **UAS Wx:** Start foundational R&D projects. Assess current weather research to determine alignment with gaps. Investigate accessibility of existing weather technology and information to UAS operations.
- **Wx Obs:** Analysis of emerging automated weather detection and reporting technologies harmonized to the establishment and validation of NAS weather observation needs.

Convective Weather

Research Requirement

- Improve observations and forecasts of convective weather and create and improve standards and techniques integration into DSPs to mitigate impacts on and improve efficiency of the NAS
- Improve accuracy over legacy systems; higher spatial and temporal resolution; well-defined probabilistic and gridded information; guidelines and strategies for developing capabilities for integration into DSPs that meet users' requirements and are applicable to their needs
- Sponsored by ANG-C6, ANG-C7, AJV, AJR, AJM
- POC: Jason Baker, ANG-C61, 202-267-1625

Outputs/Outcomes



- OPC: Blend lightning data, satellite imagery and weather model data to produce an estimate of precipitation for areas that lack radar coverage, merged with existing radar mosaic to provide controllers with better situational awareness for offshore sectors
- CWAM: Redesign of the model to incorporate machine learning techniques and optimize use in strategic time frames (2-8 hour forecasts)
- EPOCH: Probabilistic convection guidance with lead times from 0 to 36 hours used for current operations and strategic planning of transoceanic flights

FY 2022 Planned Research

- Begin transition of the OPC to AJM for integration into NWP
- Begin transition of new CWAM to AJM for integration into NWP
- Complete transition of the EPOCH algorithm to operations at the NOAA/Environmental Modeling Center (EMC) for use by the Washington World Area Forecast Center

Out Year Funding Requirements

FY20	FY21	FY22
$ 1.2M	$ 1.4M	$ 1.4M

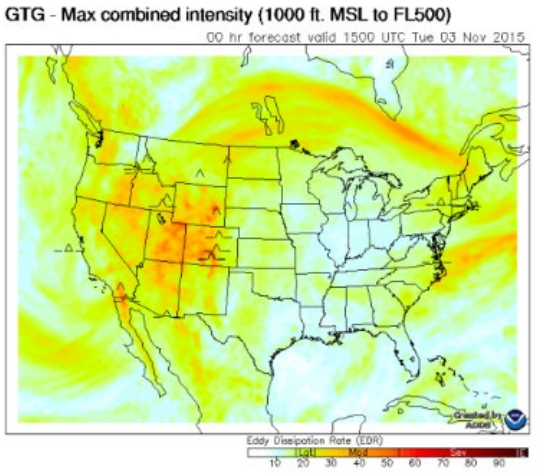
Turbulence

Research Requirement

- Improve turbulence observation and forecasting capabilities throughout the NAS to accurately identify & predict time, locations, & intensity of turbulence; improving safety, capacity, and efficiency in the NAS
- Sponsored by ANG-C6, ANG-C7, AJV, AJR, AJM
- POC: Tammy Flowe, ANG-C61, 202-267-2796

Outputs/Outcomes

- High resolution, gridded, global detection and probabilistic forecasts of turbulence (clear-air, mountain wave & convectively-induced) to support ATM DSPs, dispatcher and pilots resulting in improved safety, increased capacity and reduced atmospheric emissions within the NAS



FY 2022 Planned Research

- GTG ensembles/probabilistic development commences
- Incorporation of automated turbulence translation technique into traffic flow management decision support processes

Out Year Funding Requirements

FY20	FY21	FY22
$ 1.1M	$ 1.1M	$ 1.1M

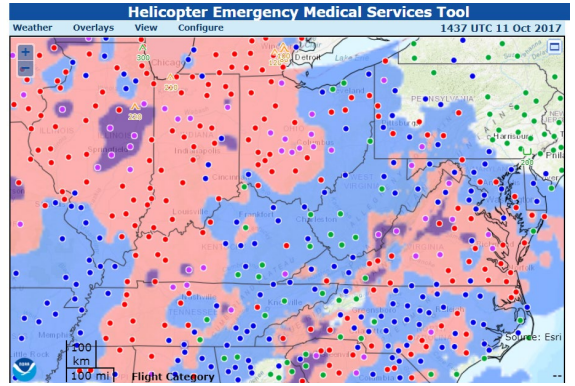
Ceiling and Visibility (C&V)

Research Requirement

- Improve C&V prediction models with the goal of reducing GA accidents/incidents and improving airport efficiency
- Applications for improved C&V predictions include support for current and future TAF production; production of automated TAFs in areas where no TAFs exists; improvements to the accuracy & resolution of AIRMETs; improvements to forecasts in TRACON areas; updates to the HEMS tool
- Done in collaboration with NWS to improve products and services the FAA requires
- Sponsored by ANG-C6, ANG-C7, AJV, AJR, AJM, AVS
- POC: Jenny Colavito, ANG-C61, 202-267-2787

Outputs/Outcomes

- Improvements to C&V information in HEMS tool via LAMP
- New data sources for C&V observations: camera based visibility & low powered ceilometers
- Supports enhanced GA safety & ATM based decision support processes, dispatchers, and pilots resulting in improved safety



FY 2022 Planned Research

- Development and testing of a super compact, low energy usage, ceilometer for use in remote areas with data gaps
- Continue development of LAMP C&V
- Operational transition of VEIA
- Development of a Slant Range Visibility capability (if need exists)
- Development of a capability to translate of C&V into airport impacts (if need exists)

Out Year Funding Requirements

FY20	FY21	FY22
$ 1.0M	$ 1.0M	$ 1.0M

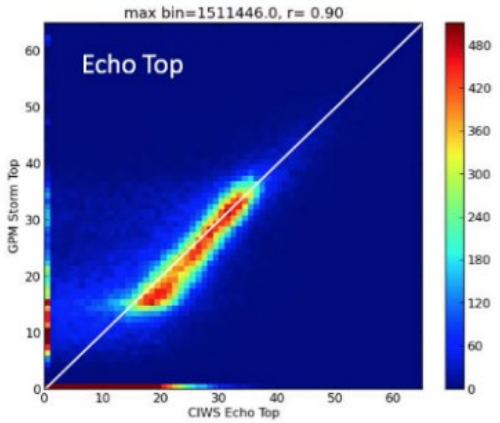
Quality Assessment (QA)

Research Requirement

- Improved observations & enhanced forecasts must have effective & reliable verification prior to becoming operational to ensure the accuracy, performance, and value of these products for NAS users
- Sponsored by ANG-C6, ANG-C7, AJV, AJR, AJM
- POC: ANG-C63 Sean Whelan 609-485-4838

Outputs/Outcomes

- Verification/assessment of aviation impact weather forecasts and analyses
- Data provided supports transition of research weather forecast products based on forecast accuracy, quality, and operational meaningfulness to ATM, dispatchers, and pilots



FY 2022 Planned Research

- Conduct assessments of FV3-based HRRR
- Alaska C&V assessment

Out Year Funding Requirements

FY20	FY21	FY22
$ 1.2M	$ 1.0M	$ 1.0M

UAS Weather

Research Requirement

- Gaps between current weather capabilities and weather information needed for safe and efficient airspace management of UAS operations
- The goals of the UAS Weather project are to further research identified gaps and explore the potential enhancement of current weather capabilities or development of new capabilities to close those gaps
- Sponsored by AFS 200,400,800, ANG-C6
- POC: Kevin Johnston, ANG-C64, 202-267-6377

Outputs/Outcomes

- Improved weather information required for safe and efficient UAS operations and integration into the NAS

FY 2022 Planned Research

- Continue collaboration with FAA UAS organizations
- Foundational projects to obtain operational feedback from Test Sites
- Assess current weather research to determine alignment with gaps
- Investigate accessibility of existing weather technology and information to UAS operations

Out Year Funding Requirements

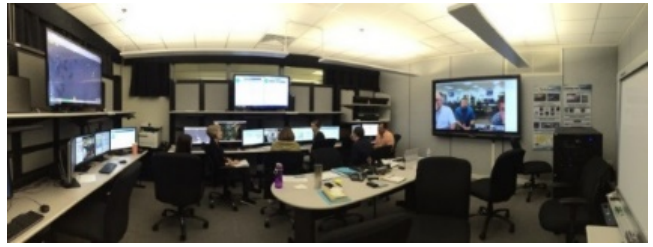
FY20	FY21	FY22
$ 265K	$ 500K	$ 750K

Aviation Weather Demonstration & Evaluation (AWDE) Services

Research Requirement

- NextGen Implementation Plan (Reduce Weather Impact & Validating Concepts) states human factors, human-in-the-loop testing and demonstrations are essential tools for validating NextGen concepts
- Demonstration and evaluation services are required to assess weather research maturity and concept readiness for transition
- Sponsored by ANG-C6, ANG-C7 AJV, AJR, AJM
- POC Sonia Alvidrez, ANG-C63; 609-485-7613

Outputs/Outcomes



- Enhanced demonstration and evaluation services with subject matter expertise, improved data resources including live aircraft situation data, and metrics capability
- Data & analysis to reduce programmatic risk, aid in definition & validation of requirements and inform AMS lifecycle management activities to improve the delivery of research capabilities developed

FY 2022 Planned Research

- Conduct assessments of diagnosis and forecasting capabilities including: Turbulence Forecasts; Ceiling and Visibility Analysis; Convective Weather Forecast Statements; Ensemble research
- Participate/support the AWC Testbed Summer/Winter Experiments
- Continue working with Space Weather Prediction Center and other partners to further develop and define radiation effects on flight crew and passengers and determine airline needs in terms of radiation information

Out Year Funding Requirements

FY20	FY21	FY22
$ 500K	$ 500K	$ 500K

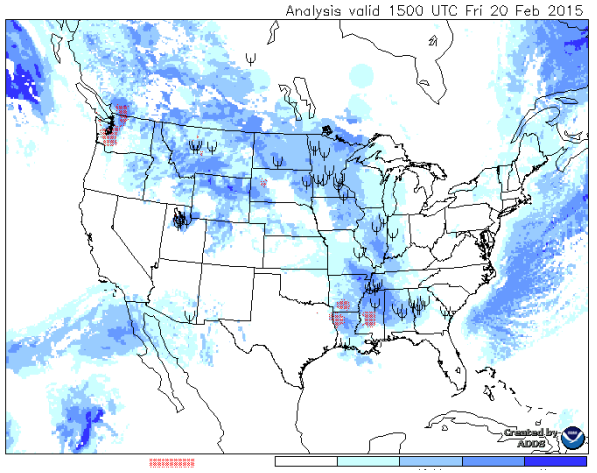
In-Flight Icing

Research Requirement

- Improve operationally-available, high-resolution, accurate diagnoses and forecasts of aircraft icing conditions that can be used by aviation users to make decisions on icing threat areas, optimum routings, and areas to avoid in compliance with recently updated regulations and aircraft certification envelopes
- Sponsored by ANG-C6, ANG-C7, AVS, AJV, AJR, AJM
- POC: Danny Sims, ANG-C61, 202-267-2785

Outputs/Outcomes

- Diagnostic & forecasts up to and beyond 18 hours over the CONUS and Alaska for operational use by ATM, dispatchers, and pilots to enhance capacity and safety



FY 2022 Planned Research

- Finalize enhanced CONUS and Alaska high resolution in-flight icing diagnosis and forecast capability for preparation to transition to NWS

Out Year Funding Requirements

FY20	FY21	FY22
$ 900K	$ 900K	$ 1.0M

Terminal Area Icing Weather Information for NextGen (TAIWIN)

Research Requirement

- Responds to operational needs - new SLD Rule 25.1420 and NextGen *Reduce Weather Impact* capacity and throughput requirements in freezing precipitation
- Develop capability/technology to manage impact of new certification Supercooled Large Drops (SLD) rule on terminal area operations; research on automated reporting systems and improved weather diagnostic/forecast tools
- Sponsored by: AFS-200, AFS-400
- POC Stephanie DiVito, ANG-E2; 609-485-7152

Outputs/Outcomes

- Improved icing weather information including SLD in terminal area
- Maintain/improve efficiency and safety in icing conditions under new SLD rules in terminal area, facilitating smooth transition to new operational rules and/or guidance anticipated from Flight Standards corresponding to new SLD certification rule

FY 2022 Planned Research

- Continue analysis of ICICLE flight test data to quantify ability to diagnose and forecast detection and discrimination of freezing drizzle from freezing rain aloft in the terminal area
- Evaluate capabilities met vs. required for TAIWIN capability

Out Year Funding Requirements

FY20	FY21	FY22
$ 1.6M	$ 1.3M	$ 1.3M

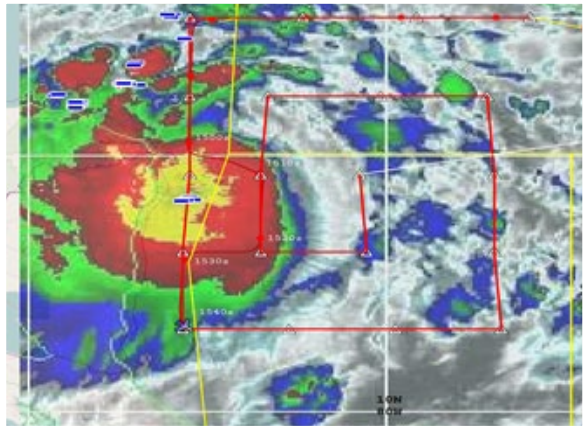
High Ice Water Content (HIWC)

Research Requirement

- NTSB: A-96-54, -56, & -58
- Characterization of HIWC ice crystal environments that can be a threat to turbine engines
- Diagnosis and forecasting of HIWC ice crystal environments
- Sponsored by AIR-6A1, AFS-400
- POC Jim Riley, ANG-E2; 609-485-4144

Outputs/Outcomes

- Atmospheric HIWC ice crystal data set sufficient for assessment of certification envelopes, development of test facilities, onboard detection for avoidance, and diagnosis and forecasting for avoidance
- Enhanced avoidance of HIWC conditions



FY 2022 Planned Research

- Analysis of FY21 flight data focusing on continental engine ice crystal icing
- Operational implementation path for ALPHA

Out Year Funding Requirements

FY20	FY21	FY22
$ 1.6M	$ 1.4M	$ 1.0M

Acronyms

- AAWU – Alaska Aviation Weather Unit
- Airmet - Airmen's Meteorological Information
- AK - Alaska
- ALPHA – Algorithm for Prediction of HIWC Areas
- AMS – Acquisition Management System
- ATM – Air Traffic Management
- AWRT – Advanced Weather Radar Techniques
- BOM – Australian Bureau of Meteorology
- BVF – Brunt Vaisala Frequency
- CIP – Current Icing Product
- CNN – Convolutional Neural Network
- CWAM – Convective Weather Avoidance Model
- DSPs – Decision Support Processes
- ECCC – Environmental & Climate Change Canada
- EPOCH - Ensemble Prediction of Oceanic Convective Hazard
- FIP – Forecast Icing Product
- FLs – Flight Levels
- GA – General Aviation
- GLMP – Gridded LAMP
- GTG – Graphical Turbulence Guidance
- GTGN – GTG Nowcast
- GOES – Geostationary Operational Environmental Satellite
- HCA – Hydrometor Classification Algorithm
- HEMS - Helicopter Emergency Medical Services
- HIWC – High Ice Water Content
- HRRR – High Resolution Rapid Refresh
- ICICLE – In-Cloud Icing and Large-Drop Experiment
- LAMP – Localized Aviation MOS Program
- LWE – Liquid Water Equivalent
- MDL – Meteorological Development Laboratory
- MRMS – Multi-Radar, Multi-Sensor
- NAS – National Airspace System
- NRC – National Research Council of Canada
- NSIP – NextGen Segment Implementation Plan
- NTSC – National Transportation Systems Center
- NWP – Numerical Weather Prediction
- NWS – National Weather Service
- OPC – Offshore Precipitation Capability
- RTMA – Real-Time Mesoscale Analysis
- RU – Rapid Update
- SRMD - Safety Risk Management Document
- SRMP - Safety Risk Management Panel
- SLD – Supercooled Large Droplet
- SWPC – NWS Space Weather Prediction Center
- TAF – Terminal Area Forecast
- TAIWIN – Terminal Area Icing Wx Information for NextGen
- TDWR – Terminal Doppler Weather Radar
- TRACON – Terminal Radar Approach Control
- UAS – Unmanned Aircraft Systems
- Wx - Weather
- Wx OBs – Weather Observations

Backup Slides

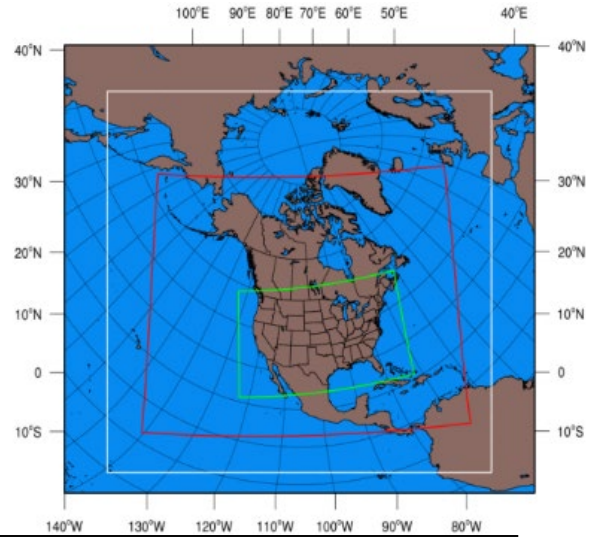
Model Development and Enhancement

Research Requirement

- Weather prediction models are the basis for all aviation weather hazard forecasts beyond 2 hours. Improvement of operationally available numerical weather prediction model resolution and refresh rates to enhance forecasts of aviation weather hazards including inflight icing, turbulence, convective weather, and ceiling and visibility will require model enhancements
- Sponsored by ANG-C6, ANG-C7, AJV, AJR, AJM, AFS, AIR
- POC: Danny Sims, ANG-C61, 202-267-2785

Outputs/Outcomes

- 0-36 hour high resolution rapid refresh to include oceanic airspace to support aviation forecast products
- Enhanced NAS safety and capacity/efficiency from improved forecasts of aviation specific weather hazards



FY 2022 Planned Research

- Conduct research towards potential FY23 implementation of rapid refresh forecast system using NWS unified forecast system to supplant current, regional, hourly-updated models

Out Year Funding Requirements

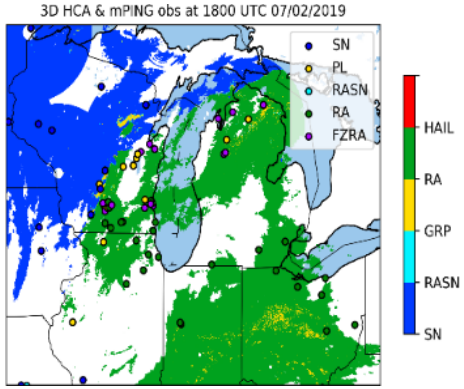
FY20	FY21	FY22
$ 1.0M	$ 800K	$ 800K

Advanced Weather Radar Techniques

Research Requirement

- Conduct and implement research toward a high-resolution, high quality, three-dimensional (3D) weather radar data analysis from national and international radar networks
- Provide improved detection and forecasting for hazardous phenomena such as turbulence, icing and convection, and deliver these products and services in a manner that allows for their rapid and effective use by NAS decision-makers
- Sponsored by ANG-C6, ANG-C7, AJV, AJR, AJM
- POC: Randy Bass, ANG-C61, 202-267-2800

Outputs/Outcomes



- Provide aviation threat-specific information through the MRMS platform
- Provide reflectivity at specific flight levels beneficial to aviation users
- Improve diagnosis and depiction of icing conditions of interest to aircraft operations
- Improve validation techniques to ensure that MRMS data can be used effectively and reliably for operational decision-making
- Integrate TDWRs into the MRMS mosaic to improve detection and intensity of weather events

FY 2022 Planned Research

- Increase the spatial coverage of MRMS capabilities over offshore areas, including areas in the Caribbean, Mexico, and the Pacific
- Implement icing and turbulence algorithms into developmental MRMS system
- Monitor performance of new products and algorithms on the developmental MRMS system

Out Year Funding Requirements

FY20	FY21	FY22
$ 457K	$ 380K	$ 380K

Weather Observations (Wx Obs)

Research Requirement

- Conduct and transition research that enhances or increases weather observations on the surface with the goal of improving capacity and surface operations.
- Evaluation of emerging observing technologies are required to validate user needs and assess readiness for formal concept demonstration and transition into operations.
- Sponsored by ANG-C6, AJV, AJM
- POC Victor Passetti, ANG-C63; 609-485-6260

Outputs/Outcomes

- Affirmation of automated weather detection capabilities synchronized to new or emerging weather observation requirements
- Reinforce the safety risk management process via early user interactions with new observing technologies to clarify desired needs and harmonize transition of new capabilities into existing weather observing platforms

FY 2022 Planned Research

- Explore new sensor technology to determine if sensor capabilities can be consolidated for future iterations of surface observing systems
- Explore how various Liquid Water Equivalent (LWE) measurements during mixed-phase precipitation can be used to develop more robust determinations of LWE
- Explore the sensitivity of measuring false accretions during “wet” snow events to develop a method for determining wet snow conditions utilizing the existing ASOS sensors (This is a potential shortfall in observations for UASs)

Out Year Funding Requirements

FY20	FY21	FY22
N/A	N/A	$ 500K