



Summary: Spring 2020 FPAW Meeting, Wednesday, April 15, 2020

The first virtual-only FPAW meeting started promptly at 1100E. FPAW Co-Chair Matthias Steiner opened the meeting by welcoming all the participants and providing an overview of virtual meeting logistics. FPAW Co-Chair Matt Fronzak then introduced the keynote speaker, FAA Administrator Captain Steve Dickson.

Steve discussed his experiences as both a military and commercial pilot. He observed that weather always played an important role in his pilot decision-making. He reviewed several key weather projects that the agency currently has underway, including the reconstitution of the FAA Weather Community of Interest (COI). Steve recognized FPAW as a one-of-a-kind, vital aviation weather forum and a key contributor to the future of aviation weather both domestically and internationally.

FPAW is grateful to Steve for providing a most excellent kickoff to our first virtual meeting!

Session 1: Weather Reporting in the NAS, Current and Future Needs, 1115-1615E

There were three separate panels during this session about Weather Reporting in the NAS. Robust question and answer sessions were conducted after each of the panels. Participant questions were read aloud by a Chat Room coordinator, and then individuals were asked for clarifications or invited to ask follow-on questions if appropriate.

Panel 1: NAS Weather Reporting

- Gordy Rother, Scott Stacy, and John Steventon from FAA/Flight Standards started off the session speaking about the present state of weather observations in the US, how 97.5% of CONUS is not within five miles of an airport and, therefore, is not covered by a METAR, the “Gold Standard” approved weather source. They discussed operational impacts, economic impacts, and how accidents and fatalities are attributed to a lack of beneficial weather information. Finally, they discussed the notion of a “Silver Standard,” where a less expensive source of reliable weather information might provide better weather coverage in the NAS for use by helicopters, unmanned aeronautical vehicles and low altitude general aviation operations. The Visual Weather Observation System (VWOS) from the FAA and broader use of the Real Time Mesoscale Analysis tool (RTMA) from NOAA/NWS were offered as examples of this type of solution.
- Tom George/AOPA discussed operating in the NAS with a lack of weather reporting. He graphically showed the paucity of reporting stations in various areas of CONUS and then compared that to the extreme lack of weather data in AK. He spoke to advantages of additional weather reporting provided by the AK Weather Camera program and the AK Aviation Guidance product (AAG). Tom briefed on a current weather survey AOPA has ongoing, in which many pilots say they would overwhelmingly use an uncertified source for weather information if there were no ASOS/AWOS data available at an airport they

fly to. He then mentioned AOPA is pleased with FAA plans to develop a VFR Weather Concept and a 2020 test with the AK Weather Camera Program.

- Dave Kochevar from the NWS/Alaska Aviation Weather Unit (AAWU) then spoke to the vastness of their weather reporting responsibilities and true sparseness of data, how the AAWU uses everything that is beneficial to good reporting and forecasting, and that very limited sources for observed weather hampers their ability to provide more robust information to aviation in AK. He spoke to VWOS, RTMA, and AAG as promising and helpful sources to allow them to improve the forecasting they do for AK aviation.

Panel 2: FAA Options

- Gordy Rother, FAA/Flight Standards, briefed a presentation on behalf of Walter Combs, FAA Flight Services, on the AK Weather Camera (WCAM) and Visual Weather Observation System (VWOS). Gordy described the existing Weather Camera capabilities and VWOS enhancements. He mentioned VWOS is automated with self-validation and self-reporting. It costs approximately 10% of an AWOS/ASOS. If approved, the WCAM program office has the capability to install 100 of the VWOS systems in five years. The system is effective in that it provides accurate and validated weather observation data and strongly supports aviation operations where a METAR does not exist. It also enables/improves NWS forecast products by supplementing/improving RTMA, TAF, LAMP, and AAG. The data from this system is intended to be freely available to the public. The plans for the VWOS program were explained with it beginning in AK and HI and then moving to the CONUS. Data enhancements will be made by sharing and receiving data from State DOTs.
- Danny Sims, FAA/NextGen shared his work, along with FAA/Flight Standards and NWS, to research the possibility of better utilization of RTMA for weather data. He described how RTMA's temperature data has been allowed to be used operationally in place of a missing METAR temperature report since 2015. His research is looking at the possibility of the same approach for other weather data such as 10M wind reports, surface pressure, visibility, and ceiling. He described the first phase of the research which is complete and how it will be followed by more detailed understanding of how effective this approach might be. This next phase will take a minimum of 13 months to complete once contracts are in place.

Panel 3: FAA and Industry Options for Solutions

- Kevin Johnston, FAA/NextGen, spoke to research into UAS weather needs. He described how the FAA has worked with partners across industry, academia, and federal agencies to compile a comprehensive list of research, forming the backbone of a five-year rolling plan that identifies possible gaps in current research that should be explored and aligns with the Agency's strategic priorities and initiatives. Kevin explained that the FAA's UAS Integration Research Plan for 2019 – 2024 identifies weather as one of their twelve focus areas. The Weather research activities focus on informing outcomes such as standards; requirements; capabilities; systems for weather information robustness, resiliency and effectiveness; and mitigation strategies to address the impact of weather

(e.g., wind, precipitation, visibility, icing and other meteorological conditions) on UAS performance. It also includes the identification, distribution, and display of weather information on UAS flight paths to improve decision making. A very important point is that the research plan identifies Weather R&D needs with the implementation phases of UAS Operational Capabilities. Finally, Kevin described the FAA's efforts to get "foundational" R&D projects started. These include operational feedback from UAS Test Sites, assessing current weather research to determine alignment with existing gaps, and investigating accessibility of existing weather technology and information to UAS operations.

- Don Berchoff from TruWeather Solutions offered some industry options for UAS weather solutions. He began with a discussion of the MIT LL study that identified gaps in existing government-provided weather products available to the UAS/UAM industry. The study listed over 20 weather information sources and assessed each one's ability to meet specific UAS weather needs. The results, overall, were poor. Don described a UAS weather sensitivity use case in which existing standards were met (a hand-held anemometer, TAF, and METAR) but the pilot experienced loss of control at 100 feet above ground due to a lack of wind measurements aloft that resulted in a crash. He explained that there is a significant difference between real data vs. inference requiring knowledge of atmospheric physics, and that we must have real time observations along with microclimate characterizations, which can come from a combination of IOT data sets, weather drones, and commercial satellites. He next described his work with the ASTM F38 Sanctioned Weather Standards Group. Finally, he described some of the weather challenges that exist in urban environments.
- Chris Baur from Hughes Aerospace then shared information on their Automated Weather Stations. He described their camera advisory weather along with remote altimeters, ceiling, wind, temp/dewpoint measurements. He mentioned how they use VHF Unicom Broadcast that is voice activated. Their data is gathered from weather camera feeds, crane feeds, drone info and ADS-B detection. They have what they call a portable AWOS which is solar/3G powered. Their weather and images are available in the Hughes App and/or on VHF Broadcast.
- Justin Hilliard from UPS Flight Forward spoke to several aspects of UPS' drone usage. He stated that UPS is the first fully certified Part 135 drone airline. This allows flight over people and moving vehicles, flight beyond visual line of sight, and package transport for hire. They have unmanned aircraft take off from hospital locations and deliver specimens to labs for testing. This increases lab efficiency because patient test results are turned around in a fraction of the time. He also stated that the carbon footprint is reduced by not using a ground carrier. Justin then explained some of their challenges dealing with UAS operations mostly taking place away from airports where the certified weather data exists. He spent a little time showing how existing, approved weather stations simply are not available for UAS operations. There are other sources of weather data, but they mostly lack ceiling/visibility data. He mentioned that weather cameras can use artificial intelligence to determine visibility and sky coverage. UPSFF is using only commercially rated (manned) pilots as operators. Each of the crew members receive

FAA-approved initial and recurrent meteorology classes, similar to an EWINS program. The closest TAF is used for the official briefing. The UPSFF Meteorology department can provide additional info if requested. Crewmembers are trained to use a calibrated handheld anemometer on site. He stressed that until we have more input for computer models, the output of those models will struggle to help UAS. The data can come from many sources but we should all work together to find a cost effective and accurate solution.

Session 2: ADS-Wx Update, 1630-1700E

- Steve Darr/Dynamic Aerospace provided an update on efforts to implement Automatic Dependent Surveillance – Broadcast Weather (ADS-B Wx). ADS-B Wx includes the transmittal of aircraft-based observations as automated Air Reports (AIREPs) or semi-automated Pilot Reports (PIREPs) via the ADS-B datalink. In 2020, a new standard for ADS-B V3 will be published that includes requirements and recommendations for ADS-B Wx, with ADS-B Wx capable avionics potentially available and providing signal-in-space within two years. Steve discussed the technical standards and community support for ADS-B Wx, along with what FPAW members can do to educate themselves and support the effort.

Session 3: FPAW Update, 1700-1730E

FPAW Co-Chairs Matthias Steiner and Matt Fronzak presented an FPAW update to the group.

- The group was reminded about the FPAW Website at <https://fpaw.aero>, and both inputs and patience were requested.
- The group was reminded about FPAW's social media presence on Facebook, LinkedIn and Twitter and invited to contribute to all.
- Fall FPAW Meetings will no longer be routinely occurring at the NBAA BACE.
- In 2020, the Fall FPAW Meeting is planned to take place in person at the NCAR Center Green Facility in Boulder, CO on October 14/15.
- We anticipate holding the Spring 2021 FPAW Meeting in person at the NTSB Auditorium in Washington, DC on TBD dates.
- We expect to hold the Fall 2021 FPAW Meeting in person at the National Severe Storms Laboratory in Norman, OK on TBD dates (provided they do not interfere with Randy Bass' NC fishing trip 😊).
- Volunteers to host future meetings (beyond Fall 2021) will be gladly accepted and queued up!
- The 2020 Weather Prize will be awarded during the Fall 2020 FPAW Meeting in Boulder, CO.



Summary: FPAW Planning Meeting, Thursday, June 16, 2020

One day after the first-ever virtual FPAW meeting, the first-ever virtual FPAW Planning Meeting was held, with more than 40 participants.

The first portion of the Planning Meeting was spent reviewing the previous day's Spring 2020 FPAW Meeting. While some participants reported experiencing technical glitches with MS Teams, most had a positive experience. Several attendees spoke strongly in favor of being able to attend FPAW meetings virtually going forward.

A lively discussion of potential topics for the Fall 2020 FPAW Meeting, planned to be held at the NCAR Center Green Facility in Boulder, CO on October 14/15, took up the remainder of the discussion. At the conclusion of the Planning Meeting, the following three main topics (session lead name/organization) were identified for the Fall Meeting:

1. Winter Weather Operations (Josh Paurus/MSP Airport Authority)
2. Emerging Graphical Weather Tools in the Cockpit and the Changing Role of the Pilot in CDM Decision Making (Rocky Stone/United Airlines)
3. Opportunities Arising from the COVID-19 Pandemic Pause and Reset (Mike Robinson/MITRE)

In addition to these three topics, there will also be short updates related to ongoing FPAW meeting topics (e.g., ADS-B Wx, VWOS, Wx COI) organized by Tom Ryan/AvMet Applications, FPAW organizational updates delivered by the FPAW Co-Chairs, and the awarding of the 2020 Weather Prize.

We hope to see everyone in Boulder, CO in October 2020!