

Spring 2021 FPAW Plenary Meeting

Day 2, 4-28-21

Chat Log – Q&A and Comments

Session Name: Emerging Standards and Certification Challenges for Novel Weather Observations

Session Lead: Steve Darr

[4/28 11:00 AM] Marilyn Pearson
inevitably there will be a conflict...

[4/28 11:02 AM] Jim Hasemann
so lucky you were not in the truck

[4/28 11:08 AM] Matthias Steiner
The bios of the speakers & panelists can be downloaded from the FPAW website
https://fpaw.aero/sites/default/files/events/2021/Bios%202021%20Spring_0.pdf

[4/28 11:12 AM] Matthias Steiner"
R&D

[4/28 11:12 AM] Bryce Ford
Sensor providers

[4/28 11:12 AM] Colleen Reiche
R&D

[4/28 11:12 AM] OConnell, Patrick CTR (FAA)
AFS-400

[4/28 11:12 AM] Michael Splitt
Academic/Research Wx

[4/28 11:12 AM] William Scura
CWSU

[4/28 11:12 AM] Matt Fronzak
Research

[4/28 11:12 AM] Zach Ladd
R&D

[4/28 11:12 AM] Jing Cheng
Research

[4/28 11:12 AM] Steven T Osborne
Research

[4/28 11:12 AM] Matt Wandishin
weather verification

[4/28 11:13 AM] Mark Klopfenstein
R&D

[4/28 11:13 AM] Whitworth, Robert H-CTR (FAA)
Robert Whitworth, FAA HQ, AJV-P, Air Traffic Procedures office (contractor support)

[4/28 11:13 AM] McClure, Andrew (FAA)
Away from keyboard for the first question! Flight Service Staff Supporting AK

[4/28 11:13 AM] Jaymi Steinberg
ATC

[4/28 11:13 AM] John Hurley
CWSU

[4/28 11:13 AM] Steve Abelman
Independent Contractor

[4/28 11:13 AM] Le Jiang
R&D, industry

[4/28 11:13 AM] Prott, Frances M (FAA)
Flight Service Safety and Operations Policy

[4/28 11:14 AM] Judith Reif
Operations/Flight Attendant/Independent Contractor

[4/28 11:14 AM] Wenze
research

[4/28 11:18 AM] Stephen Darr, Dynamic Aerospace
Thanks for raising your hand and helping me appreciate the nuanced nature of the weather community by adding your particular focus/interest!

[4/28 11:19 AM] Whitworth, Robert H-CTR (FAA)
<https://weathercams.faa.gov> does not appear to load properly using Internet Explorer

[4/28 11:19 AM] gordon brooks
If possible can you elaborate on what you mean by PIREPs are available?

[4/28 11:22 AM] Bob Avjian
Some folks may have trouble loading the weathercams.faa.gov web site depending how their company/organization web proxies are configured.

[4/28 11:25 AM] Ralph
Are the cameras a legal determination of VFR that UAS could fly on beyond line of sight

[4/28 11:25 AM] Whitworth, Robert H-CTR (FAA)
Is there any utility for a large provider, such as Port Authority of New York/New Jersey to install these systems at metro airports: LGA/EWR/JFK/HPN?

[4/28 11:26 AM] John Kosak, CAM - NBAA
We should add TEB to that list of N90 airports

[4/28 11:26 AM] Stephen Darr, Dynamic Aerospace
Are there any site use training courses available?

[4/28 11:27 AM] Whitworth, Robert H-CTR (FAA)

In other words, are these systems primarily designed to assist VFR pilots, or ALL pilots and airport operators? And yes, including TEB.

[4/28 11:27 AM] Ralph

Ralph Stoffler ASTM F38

[4/28 11:29 AM] Don

Believe this is what we are working through in ASTM and with FAA

[4/28 11:30 AM] Ralph

I will talk more about this during my afternoon session with Don b

[4/28 11:30 AM] Don

Real question is can we eventually use any camera someday to fill the gaps.

[4/28 11:32 AM] Matthew Morris

Are there any plans to expand the VEIA visibility estimates to the new weather cameras in CONUS and Hawaii?

[4/28 11:36 AM] Joe Daniele

Great product!

[4/28 11:36 AM] gordon brooks

Nice PIREP display, is there a way to display one hazard ie., isolate turbulence only or icing only?

[4/28 11:36 AM] Don

Are the camera feeds available via API?

[4/28 11:38 AM] Ralph

Do you have algorithms that give visibility from the cameras. Ralph Stoffler

[4/28 11:41 AM] Steve Arbogast

Great Tool for our domestic users and forecasters!

[4/28 11:42 AM] Rob Banks - PEMDAS

Any plans by FAA/NWS to exploit AI/ML algorithms on the camera data to provide additional information or use to validate NWP?

[4/28 11:42 AM] Mike Matthews

Visibility Estimation through Image Analytics (VEIA) is the algorithm to estimate visibility from the cameras developed at MIT Lincoln Lab. It is in evaluation mode by the FAA and is running on all WxCams maintained sites. This will include CONUS and Hawaii.

[4/28 11:43 AM] gordon brooks

Filter yes, thanks Matt!

[4/28 11:50 AM] Michael Splitt

PEGASAS - Florida Tech is currently testing AI for Cloud Obs

[4/28 11:51 AM] Chris Ringhoff

Helios provides this capability

[4/28 11:51 AM] Michael Splitt

Also, discussing identifying "obscuration" identification to fill in ons gaps that could be used for NWP initialization

[4/28 11:52 AM] Rob Banks - PEMDAS

Thanks Walt and Dave

[4/28 11:55 AM] Chris Ringhoff

Helios

[4/28 11:56 AM] Mike Matthews

Expansion to 360 degrees cameras should greatly increase the ability for VEIA to go beyond visibility to cloud ceiling, cloud type, weather type, etc.

[4/28 11:58 AM] Michael Splitt

Follow up- we have a student training the AI on important clouds to start Cb, TCU, Shelf clouds,...

[4/28 12:00 PM] McClure, Andrew (FAA)

Good job, Walter!

[4/28 12:02 PM] Tom Ryan

As always Walter, a great presentation of a superb system! Thanks.

[4/28 12:02 PM] Marilyn Pearson

Walter, thanks for a great presentation and for all the work you do with the cameras!

[4/28 12:04 PM] Matt Fronzak

Great information exchange and discussion, all. That's an FPAW hallmark!!

[4/28 12:07 PM] John Kosak, CAM - NBAA (Guest)

Check your mics friends

[4/28 12:08 PM] Whitworth, Robert H-CTR (FAA)

PIREPS has been an FAA and NTSB focus area for several years.

[4/28 12:09 PM] Matt Fronzak

@John Kosak - I checked my participants list but couldn't find any open mics except for Steve (smile).

[4/28 12:11 PM] Whitworth, Robert H-CTR (FAA)

Important: NULL reports are also of value and should be reported

[4/28 12:12 PM] John Kosak, CAM – NBAA

Agree with @Robert regarding NULL reports

[4/28 12:13 PM] John Kosak, CAM – NBAA

Thanks @Matt, I could hear someone shuffling papers and such. Gone now.

[4/28 12:14 PM] Dave Kochevar (NWS)

Is it safe to assume that this AIREP/PIREP capability would just be from aircraft equipped w/ADS-B out?

[4/28 12:26 PM] Walter Rogers

Does ADS-B V3 only apply to the 1090ES ... or does it also include UAT?

[4/28 12:27 PM] Walter Rogers

Was there consideration in developing ADS-B V3 parameters to include a sensor or detection of aircraft in/out of a cloud

[4/28 12:28 PM] Walter Rogers

Are there sensors that can easily detect an aircraft in/out of a cloud? I know of one idea used for radiosondes

[4/28 12:29 PM] gordon brooks

RE: PIREPs is there an explicit NULL report capability or will this be inferred by absence, essentially?

[4/28 12:30 PM] Polderman, Nathan

Under PIREP Parameters, is "Turbulence Location" transmitted as a Lat/Long (i.e. like an AIREP)?

[4/28 12:31 PM] Walter Rogers

What is the latency of atmospheric measurement and transmission of the message? Shouldn't the ground messaging system at least time stamp these messages?

[4/28 12:34 PM] Bob Avjian

Steve - how much "push back" have you encountered from stakeholders who want PIREPs to continue to include free text remarks? Just curious....

[4/28 12:36 PM] Rob Banks – PEMDAS

Hi Walter, yes, our ASAPS sensor can detect aircraft in/out of cloud. I can send info on the sensor to those interested.

[4/28 12:36 PM] Walter Rogers

Regarding policy... this data extremely valuable to the modeling and atmospheric community. Rather than having no mandates to use V3 and these parameters would regulators (governments) consider incentives to add V3 parameters... either \$ or increased capability?

[4/28 12:36 PM] Michael Splitt

Archive with "Full Data" to evaluate QC issues - including what would you need in real time?

[4/28 12:37 PM] Walter Rogers

Your comments on time stamping answered my questions... good ideas

[4/28 12:39 PM] McClure, Andrew (FAA)

I see lots of upside for a system including both human-generated and machine generated PIREPs. No reasons I can see to exclude either.

[4/28 12:40 PM] Walter Rogers

Clarification... does the V3 ADS-B out apply just to 1090ES but also ADS-B out for UAT?

[4/28 12:41 PM] Shelton-Mur, Karen (FAA)

What about including Volcanic Ash as one of the data types? I know this is not always something that would be present in the atmosphere but if there is a major volcanic eruption; say Mt St Helens, this could be a great way to verify the concentration of ash. For instance Ash at >2mg/m³, >5mg/m³; etc. This could help minimize the amount of airspace that would be closed.

[4/28 12:41 PM] Stone, Rocky

ADS-B version 3 standards are complete for 1090ES, but still under development for the UAT. The goal is to have the same capabilities available on UAT.

[4/28 12:42 PM] Jim Hasemann

As this would drive a lot more PIREPS I would anticipate the way we view PIREPS; 3d profile views etc on our displays/websites. Similar to crowd sourced data for car traffic

[4/28 12:43 PM] Walter Rogers

Please comment on my Policy questions ... mandate vs incentives

[4/28 12:43 PM] Bryce Ford

Aircraft In/Out of Clouds can be reported (or derived) for any aircraft equipped with WVSS-II.

[4/28 12:44 PM] Walter Rogers

cannot unmute

[4/28 12:49 PM] Stone, Rocky

To answer the question about location, ADS-B AIRREPS and PIREPS would use ADS-B position information, so yes, it would be in a lat/long format.

[4/28 12:49 PM] Keith Barr

Is Steve's email address correct...it looks like it might be missing an 'o'

[4/28 12:51 PM] Walter Rogers

Bryce... the WVSS-II is a fairly expensive "heavy weight" solution to detecting whether an aircraft is in/out of clouds

[4/28 1:05 PM] Matthias Steiner

The bios of speakers & panelists are on FPAW website

[https://fpaw.aero/sites/default/files/events/2021/Agenda%20for%202021%20FPAW%20Spring%20Meeting%202021%2004%2020%20\(1\)_0.pdf](https://fpaw.aero/sites/default/files/events/2021/Agenda%20for%202021%20FPAW%20Spring%20Meeting%202021%2004%2020%20(1)_0.pdf)

[4/28 1:09 PM] Matthias Steiner

Link to bios https://fpaw.aero/sites/default/files/events/2021/Bios%202021%20Spring_0.pdf

[4/28 1:13 PM] Stephen Darr, Dynamic Aerospace

Thanks Gary! from a (former) Army helicopter pilot

[4/28 1:14 PM] Gary Graeff

The best pilots to work with IMO

[4/28 1:18 PM] Michael Splitt

Drone threshold is sustained or gust?

[4/28 1:18 PM] Don

It is sustained

[4/28 1:23 PM] Matt Fronzak

@Don Berchoff - so, drone regs with respect to wind speeds are different than for Part 121/135 operations, which are required to use the gust value if one is included?

[4/28 1:24 PM] Justin Hilliard

Matt Fronzak the wind limitations are determined by the manufacturer of the aircraft

[4/28 1:25 PM] Don

We are working through this in ASTM.

[4/28 1:26 PM] Matt Fronzak

Justin Hilliard - I get that. But when you're operating the aircraft with a max demonstrated/certificated wind speed of nn MPH, and the reported wind speed is nn MPH with gusts to nn+ MPH, you can still operate?

[4/28 1:27 PM] Matt Fronzak

Justin Hilliard - I typed aircraft but meant UAS

[4/28 1:28 PM] Andy Alden

We needed to fly very near a DOD flight restricted zone recently and the winds at 200 ft. to 300 ft. were very different that those near the ground and very concerning overall.. I wish we'd have had much better winds aloft data.

[4/28 1:28 PM] Justin Hilliard

Matt Fronzak, I can't speak for others, but if the wind limit stated in the manual is 12kts, we would infer that as sustained and gusts. Most manufacturers will designate sustained and gust limits independently

[4/28 1:28 PM] Jeff Massey (Amazon)

Matt Fronzak Prime Air has both wind speed and wind gust limits in our Part 135. Both need to be within limits to fly

[4/28 1:29 PM] Marilyn Pearson

part 135 Ops Specs define the authorizations, these may be different from part 107 and the manufacturer's limits

[4/28 1:29 PM] Matthias Steiner

Understanding UAS performance characteristics and controllability under windy and gusty conditions is key! The other issues is that winds and turbulence can make the UAS to work harder and drain the battery charge quicker

[4/28 1:31 PM] Janet Ford

This is an issue that came up during several discussions on the pilot Education Initiatives.

[4/28 1:37 PM] Michael Splitt

Is the METAR gust reporting standard sufficient for these ops? (E.g. min gust velocity, diff between sustained and gust

[4/28 1:38 PM] Le Jiang

METAR is for airport weather, while UAS will avoid fly too close to airports due to safety

[4/28 1:38 PM] Matt Fronzak

<https://meet.ps/spring2021pawsession2-3hilliardslide15-18>

[4/28 1:39 PM] Paurus, Joshua

"No polls currently running"

[4/28 1:40 PM] Michael Splitt

But, METARs get used for many ops besides the airport

[4/28 1:41 PM] Jeff Massey (Amazon)

@michael METAR does not always report gust like you mention, and only reports every ~5 minutes with some latency. For these reasons, we do not rely on them

[4/28 1:44 PM] Michael Splitt

Terminal Doppler out of MCO?

[4/28 1:47 PM] "Dave Kochevar (NWS)

can someone elaborate on whether UAS operators can utilize non-cert data per regulation?

[4/28 1:48 PM] Scott Samson/SayWeather

AWOS only report gusts when 2-min average winds ≥ 9 kts and the gusts are 5kts above that.

[4/28 1:48 PM] Marilyn Pearson

UAS operators are held to the part 107, 91 or 135 regulations, depending on the operation and certification

[4/28 1:49 PM] Marilyn Pearson

non-cert data is not approved

[4/28 1:49 PM] Don

No...but we will discuss in next panel how we can potentially resolve problem by changing weather standards from certifying instruments to certifying data performance.

[4/28 1:50 PM] McClure, Andrew (FAA)

How will VWOS (in testing) enter the field for UAS ops?

[4/28 1:51 PM] rhonda

Matt you're not in presentation mode.

[4/28 1:51 PM] Michael Splitt

Are you expecting resolution in the Urban canopy, for example?

[4/28 1:52 PM] Walter Rogers

What is VWOS?

4/28 1:52 PM] Michael

High spatial resolution forecasts are needed, but the forecasts must also have high temporal resolution as well. Here at MIT LL we run our 90 meter model with 5-minute forecast outputs.

[4/28 1:52 PM] Walter Rogers

tHX

[4/28 1:53 PM] Rob Banks – PEMDAS

Perfect application for probabilistic forecasting!

[4/28 1:53 PM] Matthias Steiner

You have to go to meter resolution to capture vortices shedding off buildings! You need GPU-enabled fast modeling capabilities to achieve that.

[4/28 1:54 PM] Matthias Steiner

Here is link to bios again

https://fpaw.aero/sites/default/files/events/2021/Bios%202021%20Spring_0.pdf

[4/28 1:55 PM] Rother, Gordon (FAA)

com issue

[4/28 1:55 PM] McClure, Andrew (FAA)

In the immortal words of Ahnold: "I'll be back!"

[4/28 1:57 PM] Jeff Massey (Amazon)

seeing lots of comments about high resolution modeling. My personal view is higher resolution NWP models are not the full answer. Yes, we need the distribution of expected wind conditions that a drone may encounter, but we don't need to know the exact wind forecast at every backyard, or every city corner. There are other approaches to capture wind distributions than NWP

[4/28 1:57 PM] Don

Probabilistic forecasts work if you can validate the reliability of the probabilities at 1KM resolution from the surface to 5,000 feet. Not sure that is in the cards for a few years--expensive to run and how can you verify reliability without real weather data?

[4/28 1:58 PM] Paul Heppner

Need drones to be collecting weather data as they fly and then pool that data nationwide to get more of a view

[4/28 1:58 PM] Marilyn Pearson

VFR also ensures the aircraft will not enter IFR conditions, e.g. icing and conditions the drone cannot operate within

[4/28 1:59 PM] Gary Graeff

higher resolution models without higher resolution data = same errors at higher resolution IMO

[4/28 2:00 PM] Matthias Steiner

Yes, UAS carrying weather sensors will provide more information where you need it for shared situational weather awareness and usable for fine-scale model validation, nowcasting, etc.

[4/28 2:01 PM] Justin Hilliard

Gary nailed it. We must increase the input, validate the input, in order to improve the output. Scaling to terrain isn't a solution

[4/28 2:02 PM] Andy Alden

Paul Heppner Great idea. Perhaps it could be shared with the aircraft ID data that will be required in the future. UAVs can calculate wind vectors without the addition of additional sensors as long as they have good GNSS data.

[4/28 2:04 PM] Gary Graeff

The push pull there is that private creators of wx data are a little less willing to freely share that data. The next explosion of wx data will not fall under WMO sharing regulations.

[4/28 2:04 PM] Paul Heppner

Exactly Andy. The idea is that the UAV needs to gather data to benefit itself and then the ops community at large. Shared data

[4/28 2:12 PM] Dave Kochevar (NWS)

I forget who, but there some private groups/universities looking at deriving VIS from DOT cams using ML/AI

[4/28 2:13 PM] Gary Graeff

Great point. UAS are sensitive to weight. Affects flight control, and battery life, at least right now. More sensors = more weight.

[4/28 2:13 PM] Matt Fronzak

<https://meet.ps/spring2021fpawsession2-4combs>

[4/28 2:13 PM] Andy Alden

2nd what Dave K. said.

[4/28 2:13 PM] Fuka, Daniel

If anybody wants to team up on using the UAS fleet GPS for real time atmospheric moisture profiling, please hit me up! I have a similar project initiated.

[4/28 2:14 PM] Prasad, Narasimha S. (LARC-D211)

Hello Daniel,

[4/28 2:15 PM] Prasad, Narasimha S. (LARC-D211)

I would be interested to join since I have working with weather sensors for UAV platforms?

[4/28 2:18 PM] Prott, Frances M (FAA)

Fuka, Daniel I'd be very interested as we've been working on a concept over at Flight Service.

[4/28 2:18 PM] Ethan

Daniel - I would like to join to. Purdue has a team that has been developing algo's for stitching together static data with dynamic (vehicle-based) sensor data.

[4/28 2:20 PM] Rob Banks – PEMDAS

Hi Daniel, we at PEMDAS currently do similar work for the US DoD.

[4/28 2:20 PM] Rob Banks – PEMDAS

I'd be interested to learn more as well.

[4/28 2:21 PM] Eden, Mark, FFTMEC ASAP Chairman & ERC

That's brilliant!

[4/28 2:22 PM] Walter Rogers

So... is VWOS just a camera augmented "silver standard) version of AWOS?

[4/28 2:22 PM] Walter Rogers

also... VWOS is lower cost

[4/28 2:26 PM] Fuka, Daniel

Prasad, Prott, Ethan, Rob Banks, Per GPS atmospheric sounding... could you email me at drfuka@vt.edu and I will set up a "birds of a feather" network.

[4/28 2:34 PM] Walter Rogers

Can the Meeting Chat be archived and made available to participants?

[4/28 2:36 PM] Don

Daniel Fuka: Please add me to the the group...don.berchoff@truweathersolutions.com

[4/28 2:39 PM] Justin Hilliard

UAS operators definitely have a goal to add weather sensors to UAS, not just to collect data for forecasting, but to collect real time data to assist with the actual flight for detect and avoid in BVLOS (beyond line of sight) flights. UAS have the requirement to detect and avoid both manned/unmanned/air/ground hazards as well as weather. The pilot's eyes are removed from the equation, so sensors must supplement. Increased sensor load = less payload. It's certainly a tradeoff

[4/28 2:43 PM] Paul Heppner

Great insights Justin. Aside from temperature and humidity, what other weather sensors would you put on a UAS? Wind derived by GNSS or other means?

[4/28 2:44 PM] Matt Fronzak

Walter Rogers - that is our intent - archive and make the conversations available on the <https://fpaw.aero> website.

[4/28 2:48 PM] Justin Hilliard

@paul ideally we would get the same data as a radiosonde. Potentially the ability to record ceiling/visibility along or near the route. There are double use active sensors such as radar or lidar, that could provide both aircraft avoidance and weather detection

[4/28 2:49 PM] Fuka, Daniel

Paul and Justin, I am suggesting that many UAVs have a lot of atmospheric sensing already imbedded. in situ Pressure, temp, and GPS SNR to 10+ satellites, and cellular SNR are all pretty easily extractable. currently I am serial tee on the GPS serial outputs and collecting

[4/28 2:50 PM] Paul Heppner

Thank you Daniel and Justin. I will reach out to each of you offline. Very nice discussion

[4/28 2:52 PM] Justin Hilliard

@ Daniel Fuka, you are correct. The UAS will typically have a barometer, GPS, cell, and potentially thermometer. At this point we would need to leverage the manufacturer to use higher quality sensors before trying to extrapolate the data

Session Name: Updates from Ongoing Topics

Session Lead: Tom Ryan

[4/28 2:39 PM] Matthias Steiner

Is the FAA Office of Environment and Energy (Kevin Welsh) part of the Wx Community of Interest? They are looking at longer-term weather (i.e., climate) impacts on aviation. It might be good to take a longer-term outlook as well.

[4/28 2:42 PM] McClure, Andrew (FAA)

Yay, PIREPs!

[4/28 2:49 PM] Marilyn Pearson

great presentation Bill, nice logo!

[4/28 2:50 PM] Stacy, Scott (FAA)

Wonder who designed that logo?....hehe

[4/28 3:20 PM] Seth Linden

I have to run. Thanks Matthias and Matt for hosting a great meeting. If you have any questions about the Runway Friction Prediction System (RFCPS) please email me (linden@ucar.edu) or Josh (Joshua.Paurus@mspmac.org). Thanks everyone!

[4/28 3:20 PM] Tom Ryan

Thanks Seth!

[4/28 3:22 PM] John Kosak, CAM – NBAA

Mike Robinson - do the DFW numbers take into account the runway closure they had for a long time?

[4/28 3:26 PM] Flowe, Tammy (FAA)

This is fascinating! Thanks Mike.

[4/28 3:26 PM] Matthias Steiner

People are renting RVs rather than flying ;-)

[4/28 3:27 PM] Tom Ryan

RVs sure are wonderful!

[4/28 3:35 PM] John Kosak, CAM – NBAA

Mine is not important

[4/28 3:36 PM] gordon brooks

Thanks Mike!

[4/28 3:38 PM] George, Tom

Is there a place for stakeholder outside the FAA to find info/status on individual Weather COI SWATs?

[4/28 3:39 PM] Don

Excellent job.

[4/28 3:39 PM] Fuka, Daniel
Thanks!

[4/28 3:39 PM] Marilyn Pearson
Tom- the answer is no, but you may offer information as a SME

[4/28 3:39 PM] Judith Reif (Guest)
Great presentations!

[4/28 3:39 PM] George, Tom
Thanks, All!

[4/28 3:40 PM] Fuka, Daniel
Thanks!