Spring 2021 FPAW Plenary Meeting

Day 3, 4-29-21

Chat Log – Q&A and Comments

Session Name: Operational Airspace Capacity Estimation/Prediction under Convective Weather Impact

Session Leads: Le Jiang and Ernie Stellings

[4/29 11:03 AM] Matthias Steiner
Bios of speakers & panelists are on FPAW website, here is the link
https://fpaw.aero/sites/default/files/events/2021/Bios%202021%20Spring_1.pdf

[4/29 11:05 AM] John Kosak, CAM – NBAA
Good job boss!

[4/29 11:46 AM] Matthias Steiner
From an AOC and ATC perspective, to what extent was the weather forecast for the April 11 event perceived as accurate?

[4/29 11:46 AM] Matt Fronzak
This is really interesting stuff, Greg, Bill and Tim. I'm shocked there aren't questions and comments from the peanut gallery!!!!

[4/29 11:47 AM] Rob Banks – PEMDAS
My question is do we think the convective weather forecasts are at an accurate enough point for more granularity in the programs?

[4/29 11:48 AM] Rob Banks – PEMDAS
Perhaps probabilistic forecasting would give the uncertainty info needed for the granularity needed!

[4/29 11:49 AM] Michael Splitt
I am curious how differentiated the system is to the convective vs. stratiform regions of these MCSs and the use of LTG. Particularly with trying to “trim” regions.

[4/29 11:52 AM] Mark Klopfenstein
In addition to the accuracy of forecasts there is the concern of the stability of the forecasts. If the forecasts keep changing significantly from hour to hour it makes it challenging to plan and not fall back into a wait and see mode.

[4/29 11:59 AM] David Bieger (NOAA/NWS)
Interesting perspective...I put together a TMR input for this event...that area was forecast accurately from D4 onward, including on PERTI the day prior. How better could that have been communicated/emphasized?

[4/29 11:59 AM] Jason Baker
Ref the tools TFM needs I think it would be good to have a follow on discussion on that...lots of tools out

there now but interested in gaining feedback so we can consider revamping the convective weather suite. Are things like TCF, CWAP, TFI used?

[4/29 12:00 PM] Michael Splitt
Funny enough I had emailed FIT Aviation (flight school) at KMLB that morning to warn the about the hail/wind threat that day

[4/29 12:02 PM] David Bieger (NOAA/NWS)
From a TCF collaborator perspective, and the way we train traffic managers, medium generally implies a lack of permeability.

[4/29 12:04 PM] Michael Splitt
This type of organized MCS is not that common in FL — not your typical sea breeze related summer convection. Not sure how that awareness played into the decision making.

[4/29 12:04 PM] Eick Donald
NTSB from an accident stand point the April 11, 2021 convective event resulted in no aircraft accidents or incidents, the system worked! Thanks to very professional airline dispatch/operations control, ATC/Command Center efforts! Know delays and cancellation were significant, but safety was prime consideration!

[4/29 12:04 PM] Matthias Steiner
Probabilistic forecasts are challenging to interpret. What is predicted, something to happen, intensity, structure, location, etc.

[4/29 12:05 PM] David Bieger (NOAA/NWS)
An analog to this event was 10 Apr 2018...not as widespread an event but very similar

[4/29 12:07 PM] Johnston, Kevin L (FAA)
If you start looking at probabilistic forecasts, for better communication between weather community and TFMers, we need to make a linkage between weather prob thresholds and terminology TFM uses that a TMI is possible, probable or expected

[4/29 12:07 PM] Jason Baker
Matt F check your email. 😀

[4/29 12:08 PM] Matt Fronzak
Jason Baker - just got it.

[4/29 12:11 PM] Chris Brinton
Does the TFI tool allow an arbitrary region of airspace to be identified and analyzed in the tool?

[4/29 12:14 PM] Niznik, Timothy
Similar to forecast validation, does the TFI tool have a sense of "actual" permeability to evaluate the forecasted permeability?

[4/29 12:28 PM] Rademaker, Curt (FAA)
Jason, Can you share the link to the TFI tool?

[4/29 12:36 PM] Mike Matthews
The TFI tool is currently on the COSPA website. Anyone with access to COSPA can click 'Traffic Flow Impact'

[4/29 12:43 PM] Jason Baker
The TFI tool I showed is on Cospa...they are predetermined areas.

[4/29 12:46 PM] Mike Matthews
You can review previous cases on COSPA also. Not just a realtime tool. Looking back at 4/11 as Jason showed you can see the evolution of the forecast. They are predetermined areas and we have limited the number shown in the development tool. However, we have evaluated and trained on many many more.

[4/29 12:46 PM] Cobbett, Erin A
Jason - are there any efforts underway to develop more areas, ZMA for example?

[4/29 12:47 PM] Walter Rogers
Mathias, Matt, Don Berchofff.. I have written comments for the Low-Level Operations Weather Needs and ... Technology for Remote Observations session. Here's a Dropbox link: https://www.dropbox.com/s/3hlm84h4xgaewpw/Comments_Technology_for_Remote_Observations_WRogers_FPAW_20210428.pdf?dl=0

[4/29 12:48 PM] Jason Baker
The concepts of interrogating weather to flows are similar. I agree this is the direction we need to go to help the NAS manage convective weather. Not sure, I don't manage CoSPA...would need to ask.

[4/29 12:49 PM] Matt Fronzak
@Walter Rogers thank you

[4/29 12:50 PM] Pokodner, Gary (FAA)
Matt, can you load the file on the FPAW site. The Government network has Walter's link blocked with NO option to access it.

[4/29 12:51 PM] Matt Fronzak
Pokodner, Gary (FAA) WILCO (I hope)

[4/29 1:03 PM] David Bieger (NOAA/NWS)
Ken Fenton (NOAA/GSL)...why hexagons vs. octagons? The latter would get you the additional E-W track, wouldn't it?

[4/29 1:04 PM] Matt Wandishin
Dave, the hexagon is the largest n-sided polygon that can be used to create a regular grid. If you think of a soccer ball, octagons have to be mixed with pentagons to "fill the space."

[4/29 1:05 PM] Ken Fenton (NOAA/GSL)
Hexagons fit nicely together in a gridded pattern without gaps, while also giving an accurate representation of the constraint from all angle of traffic flow. We test out a number of shapes and found that the hexagon gives an accurate representation of the constraint from all possible angles while keeping the number of computations down to maintain efficiency.

[4/29 1:09 PM] Bob Avjian
Ken Fenton (NOAA/GSL) Hi Ken, in practice, the FCI shortest path reroute algorithm would need to incorporate the various restrictions, constraints and traffic deconfliction methods used by ERAM...on a ARTCC by ARTCC basis.

[4/29 1:09 PM] David Bieger (NOAA/NWS)
Thanks, Matt and Ken! I learned something new today...despite my efforts to the contrary :)

[4/29 1:13 PM] Ken Fenton (NOAA/GSL)
Bob Avjian Hi Bob, yes, that's absolutely true. The shortest-path algorithm was done as a proof of concept example and in the future we would want to add the constraints you mentioned to give a more realistic depiction of route options that include more than just weather information.

[4/29 1:17 PM] Matt Wandishin
Bob, in addition to what Ken just said, the approach he showed is not meant to be used as a traffic flow model, but rather as a tool to assess model performance in the context of impact to traffic flow. So the idea is to compare the shortest path available from the forecast to that in the observations to determine how well the forecast captured traffic flow impact. There are a lot of aspects of the forecasted weather that are irrelevant to this particular use; this is an attempt to focus just on the relevant aspects.

[4/29 1:19 PM] Mirmohammadsadeghi, Navid
In the MOSAIC model, how do you estimate new rates per region, did you train an algorithm based on historical reductions in capacity for similar past convective patterns, or do you model the weather online and see how many flights might be impacted?!

[4/29 1:20 PM] Chris Brinton
Great question. We model the weather and the flights online to see how many flights might be impacted, and also where they may offload to. That way, we get the secondary impacts of the flight rerouting.

[4/29 1:23 PM] Michael Splitt
Do you notice any regional/seasonal variations in performance?

[4/29 1:27 PM] Bob Avjian
Matt Fronzak: you should have Walter's comment file now

[4/29 1:27 PM] Mike Robinson
Hi Mike M - for more multi-dimensional flow sectors like ZID or ZME, does TFI 'pick/settle' on one preferred flow direction (for permeability)?

[4/29 1:28 PM] Mike Robinson
*multi-directional (that is)

[4/29 1:29 PM] Matt Fronzak
Bob Avjian yep, saw it come through. THX!

[4/29 1:31 PM] Mike Matthews
Hi Mike R - TFI regions can be orientated in the different flow directions in multi-directional flow sectors and considered for different flow programs. For managers they then may consider the combined impact on their resources. We have also created a similar sector based model but as you know this is a difficult 'scale' to forecast 8 hours in advance as the uncertainty becomes way too large.

[4/29 1:43 PM] Bob Avjian
Dean Fulmer: ERAM does include DSTs..for example, D-Position "ERAM Decision Support Tool" (EDST)... (smile)

[4/29 1:51 PM] Dean Fulmer
Hi Bob Avijan - Of Course! Just didn't want to give the impression that ALL DST's need to end up in critical systems! Dean Fulmer

[4/29 1:57 PM] Michael Splitt
Does concern about above “Convection” turbulence impact on usage of echo tops in the traffic management decisions?

[4/29 1:57 PM] Mike Robinson
JX7 seems like a nice place to focus - especially given how traffic volume (and passenger predilections) are setting up during pandemic recovery

[4/29 1:58 PM] Mike Robinson
Great presentation Jim

[4/29 1:58 PM] Bob Avjian
Nice presentation, Jim (smile)

[4/29 2:04 PM] Polderman, Nathan
Regarding echo tops, United Airlines and I suspect the other majors as well, instruct pilots to avoid overflight of thunderstorms as a matter of policy, unless if not practical attempt to overfly cells by at least 5,000 ft.

[4/29 2:04 PM] Jason Baker
Is there interest from the panelist in pulling tools together into a single convective weather system? What would you like it to have?

[4/29 2:07 PM] Debbie Kowalewski -ADF
It would be great to see the FCA Throughput rates chart published on the OIS page. Like the airport Arrival rates for different conditions are there.

[4/29 2:11 PM] Mike Robinson
Re: echo tops discussion....Get to those wx types that Jim mentioned...high-topped but smooth regions associated with stratiform rain and its slower (less turbulent) rising motions....compared to updraft peaks in convective cells that Mike M mentioned

[4/29 2:12 PM] Polderman, Nathan
1000ft for every 10 kts of wind I think

[4/29 2:12 PM] Rother, Gordon (FAA)
nathan is correct 1000 per 10 knots

[4/29 2:13 PM] Polderman, Nathan
United elected to remove reference to that rule-of-thumb many years ago due in part to latest research on CIT

[4/29 2:15 PM] Mark Klopfenstein
Has anyone done an opportunity analysis associated with echo tops. How often are there low-echo tops storms impacting major routes

[4/29 2:18 PM] Mike Matthews
I agree with Mike R – wx type is very important here especially thinking of when echo tops overflight is an option. In TFI we try to characterize weather type in the feature extraction from the forecasts to assist in characterizing the forecast uncertainty.

[4/29 2:19 PM] Matt Fronzak
Mike Robinson - sounds like we need to leverage the GOES-R family of satellite's capability plus AI to do an on-the-fly classification of thunderstorm types and then identify them as candidates for overflight AOA FLnnn.

[4/29 2:19 PM] Judith Reif
As a flight attendant for 20 years, I have had 2 bozo pilots fly over tops. Not good! There were options to go around and they chose not too!

[4/29 2:19 PM] Fu, Alex (FAA)
How difficult will it be to extend all we've heard here to low-altitude airspace more pertaining to UAS/UAM/AAM?

[4/29 2:19 PM] Mike Matthews
Mark K - great question. Of all the impacted events, what percent would have the echo top that pilots would fly over?

[4/29 2:19 PM] Mike Robinson
Mark K - not sure if this has been explicitly conducted; A lot of it is predicated, more broadly, on historical occurrence of forcing and thermodynamic environment that drives echo tops environment. One can look at all of this. It's more valuable to assess this echo tops query when joined by coincident occurrence of reflectivity / VIL conditions level 3+, level 5+ as well

[4/29 2:20 PM] Michael Splitt
Shear near storm top is perhaps important in terms of wave breaking (at least for some studies related to some electrical phenom)

[4/29 2:20 PM] Mike Robinson
Heather Reeves and CIMMS folks have done MRMS-derived Etops-type 'climos' in the past, but don't think quite like this (back to Mark K's comment)

[4/29 2:23 PM] Matt Wandishin
Mike R., at least some 4-5 years ago when we looked at it, there were large differences between CIWS and MRMS echo top estimation. So Heather's results may need to be calibrated.

[4/29 2:25 PM] Mike Robinson
Mike M....Right - I'm aware.....but reasons are understood I think. Also, it as for different applications so probably not applicable to question considering here

[4/29 2:25 PM] Mark Klopfenstein
In our work with 3D permeability with Mosaic that Chris B. mentioned, we did a small opportunity analysis. We found a small, but potentially beneficial, number of events that might allow routing over the echo tops. Needs further study to determine if the extra workload to manage flights going over is worth the effort of tracking all this.

[4/29 2:25 PM] Dean Fulmer
Alex Fu, the concept of scaling the discussion today to apply to UAS/UTM/UAM/AAM is a really good one. There are clear opportunities wrt convection but there are other needs as well that could be included on a similar DST. LLWS, Icing, Turbulence, Micro-weather and other wx forecasts could certainly be incorporated. Dean Fulmer

Session Name: FPAW Updates

Session Leads: Matt Fronzak and Matthias Steiner

[4/29 2:37 PM] Jonathan Leffler (AWC)
Randy, completely agree

[4/29 2:42 PM] Walter Rogers
Mathias, Matt, Don Berchofff.. I have written comments for Wed Apr 28th Low-Level Operations Weather Needs and ... Technology for Remote Observations session. Here's a Dropbox link: https://www.dropbox.com/s/3hlm84h4xgaewpw/Comments_Technology_for_Remote_Observations_WRogers_FPAW_20210428.pdf?dl=0

[4/29 2:43 PM] Frank Brody
Consultants

[4/29 2:44 PM] Walter Rogers
Consultants... yes. Weather Decision Support providers

[4/29 2:45 PM] Walter Rogers
it could be in the Users group

[4/29 2:46 PM] Bob Avjian
I believe the four groups cover it all (less is more!)

[4/29 2:46 PM] Pokodner, Gary (FAA)
Sometimes we get manufacturing like Honeywell, Rockwell, Harris, Aspen, etc,

[4/29 2:46 PM] Bryce Ford
Equipment suppliers. We only "produce Wx Info" if people buy the equipment.

[4/29 2:46 PM] Jim Hasemann
Associations

[4/29 2:46 PM] Dean Fulmer
I'm offline on another call for the moment

[4/29 2:47 PM] Jonathan Leffler (AWC)
I think your suggestions are a good crosscut... Ops, Research, and Policy

[4/29 2:47 PM] Jack May
I see manufacturers are Users.

[4/29 2:48 PM] Pokodner, Gary (FAA)
They are different. We get much less equipment manufacturers to avoid commercial briefings, but at times we bring them in.

[4/29 2:49 PM] Mike Robinson
We've done FPAW session on Space Weather in past - and space ops becoming a focus: Friends and Partner of Aerospace Weather?

[4/29 2:49 PM] Janet Ford
There needs to an area that focuses on introducing weather to non-pilots now infiltrating the aviation world because of the evolution of drones.

[4/29 2:52 PM] Bryce Ford
FYI - an interesting webinar from Eurocontrol that some may be interested in: https://www.eurocontrol.int/event/eurocontrol-stakeholder-forum-aviations-impact-non-co2-emissions

[4/29 3:02 PM] Bryce Ford
Agree - procedurally, if FPAW is going to take a position on something, there needs to be some rules on who gets a vote and how that gets done. We need to avoid the potential for one Public agency, Private company, or Academic institution to get 5000 people to vote a particular way. But giving all power to a small Steering Committee is a risk as well. A few unpopular positions and we instantly have zero participation.

[4/29 3:12 PM] Janet Ford
Should we go back and ask, Why was FPAW established and what problem was FPAW designed to solve?

[4/29 3:12 PM] Flowe, Tammy (FAA)
Thank you Jud. That's very good input.

[4/29 3:14 PM] Jonathan Leffler (AWC)
Could the Steering Committee be viewed as an advisor group?

[4/29 3:16 PM] Michael Splitt
Perhaps baby steps — focus the steering committee on how to continue the dialogue on issues rather than creating statements?

[4/29 3:21 PM] Matthias Steiner
To Janet Ford, check out https://fpaw.aero/about/history

[4/29 3:21 PM] Janet Ford
Thanks Matthias.

[4/29 3:21 PM] Bob Avjian
Hi Bruce!

[4/29 3:26 PM] Janet Ford
FPAW offers a platform for introducing or further discussing hot topics in aviation weather for pilots and users. This is a really good opportunity to reach the aviation community and provide them information they may not otherwise get.

[4/29 3:28 PM] Bob Avjian
Matts and everyone... great FPAW. I have to run....

[4/29 3:28 PM] Walter Rogers
Interesting valuable discussion on the "advisory" role of FPAW. I welcome the opportunity to express my views to a diverse COI.

[4/29 3:34 PM] Matthias Steiner
https://fpaw.aero

[4/29 3:36 PM] Rob Banks – PEMDAS
Thanks all

[4/29 3:37 PM] "Debbie Kowalewski -ADF
thank you!

[4/29 3:37 PM] Bryce Ford
Thanks!!!