



ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

The EUMETSAT & FMI Aviation Testbed –project

User Feedback

Presented in NWC SAF User's Workshop 2025

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Paajanen, Ville Karppinen



1. INTRODUCTION TO AVIATION WEATHER FORECASTING
2. PROJECT INTRODUCTION
3. RESULTS FROM THE FORECASTER TESTBED FEEDBACK SURVEYS
4. FUTURE PLANS
5. CONCLUSION

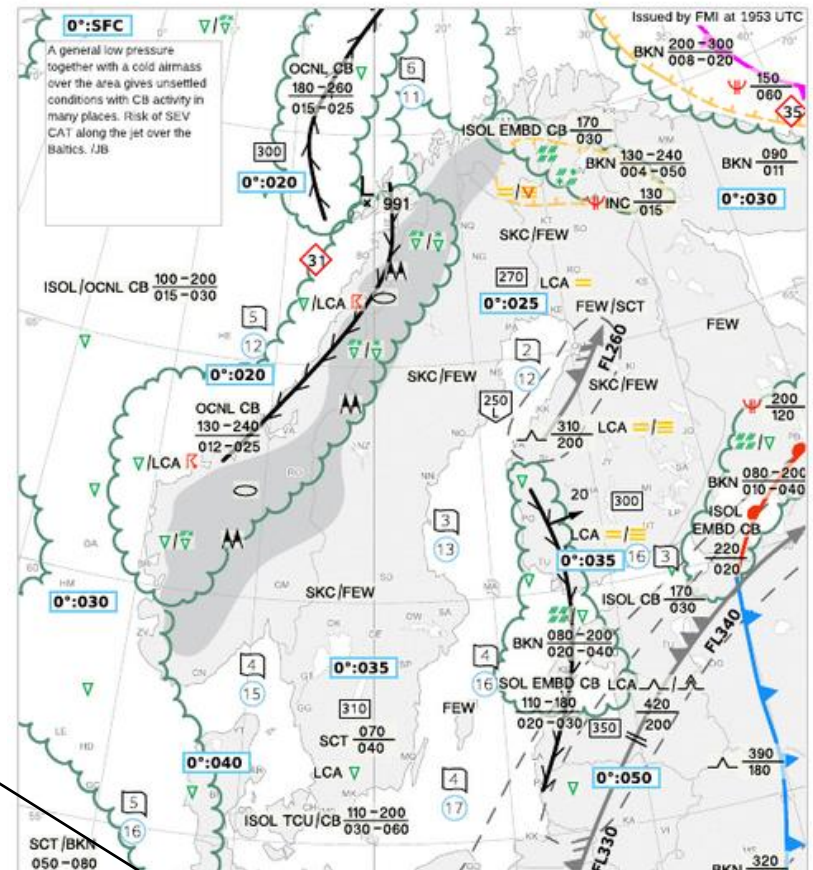


Aviation weather services in Finland and generally

- Meteorological Watch Office is responsible of aviation warnings messages
- Scandinavian significant weather chart for civil aviation (in collaboration with Sweden, Norway, Denmark)
- Terminal aerodrome forecasts (TAF)
- Various other customer specific forecast services

SWC SFC-FL450

valid time 00 UTC 29.09.2024



TAF EFHK 281733Z 2818/2918 27005KT 9999
FEW013 SCT025 PROB30 2821/2902 4000 MIFG
PROB30 2902/2905 FEW020TCU TEMPO
2910/2917 SCT035CB=



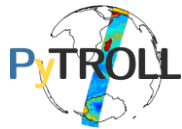
The project

- The EUMETSAT & FMI Aviation Testbed project is part of EUMETSATs' User Preparation for MTG and EPS-SG
 - Also known as AviTestbed
- To help the EUMETSAT Member States with the uptake of the next-generation data in operational aviation forecasting.
- The testbeds have two main purposes:
 - Transmission of knowledge and skills about satellite products for operational aviation meteorology in the operational environment
 - **Evaluation of new products during MTG commissioning and begin of operations.**



Project tasks

- Prepare testbed infrastructure



- Develop learning approach and prepare training material
- Organize testbeds for experts, forecasters and customers
- **Collect feedback**
 - Feedback collected from different testbeds to further improve the concept
 - For forecaster testbed pre-survey, feedback survey, **follow-up survey and product feedback**



Project timeline

- **Year 2022:**
 - Survey: satellite training and use of satellite products
 - Expert workshop on icing
 - Preparing Geoweb for the testbeds
- **Year 2023**
 - Expert workshop fog and low clouds
 - Forecaster testbed: icing and fog & low-clouds
- **Year 2024**
 - Expert workshop on turbulence
 - Forecaster testbed (icing, fog & low-clouds, turbulence)
 - Customer testbed
- **Year 2025 (-2026)**
 - Expert workshops (Spring + Autumn)
 - Forecaster testbeds (Spring + Autumn)
 - Customer workshop (Autumn)



Expert Workshops

AviTestbed expert workshop on **icing**

31.8.-1.9.2022 in Helsinki

- 13 + 4 on-line

AviTestbed expert workshop on fog and low clouds

27.-28.4.2023 in Helsinki

- 11 + 12 on-line

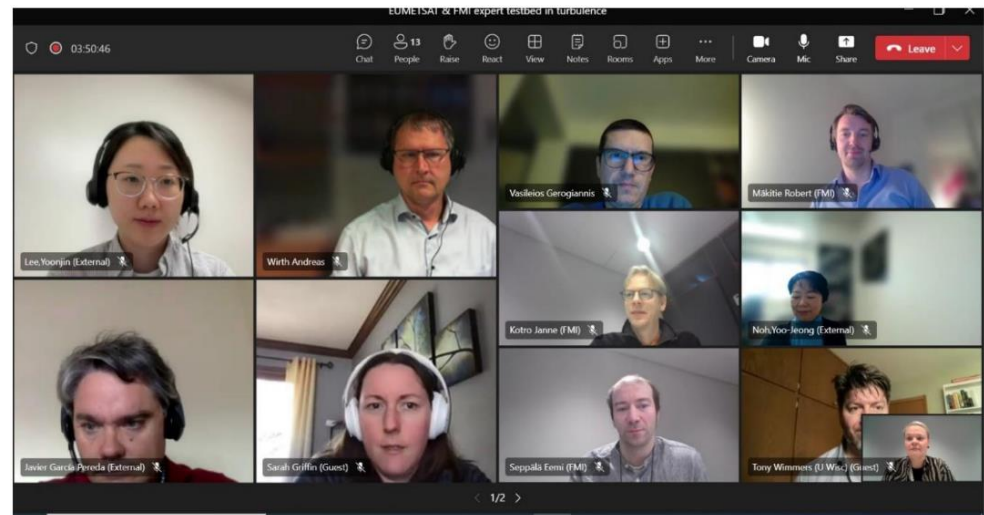
AviTestbed expert workshop on turbulence

online 21.3.2024

- 14 on-line



- *A good overview of the activities of other groups in the icing community*
- *Wide range of topics and background of the participants. Good discussions, nice meeting people from different institutions*
- *All the presentations were excellent*



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Expert Workshops

AviTestbed expert workshop on icing
31.8.-1.9.2022 in Helsinki

- 13 + 4 on-line

AviTestbed expert workshop **on fog and low clouds**
27.-28.4.2023 in Helsinki

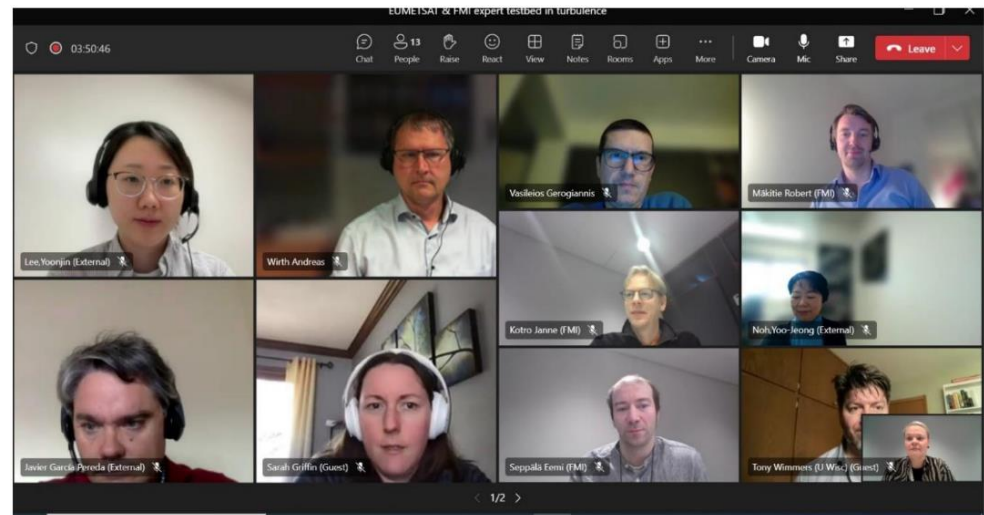
- 11 + 12 on-line

AviTestbed expert workshop on turbulence
online 21.3.2024

- 14 on-line



- *There is big interest in fog. To put the different groups/developments can perhaps promote collaborations.*
- *We have had good discussions, even with the hybrid online-in person scheme.*



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Expert Workshops

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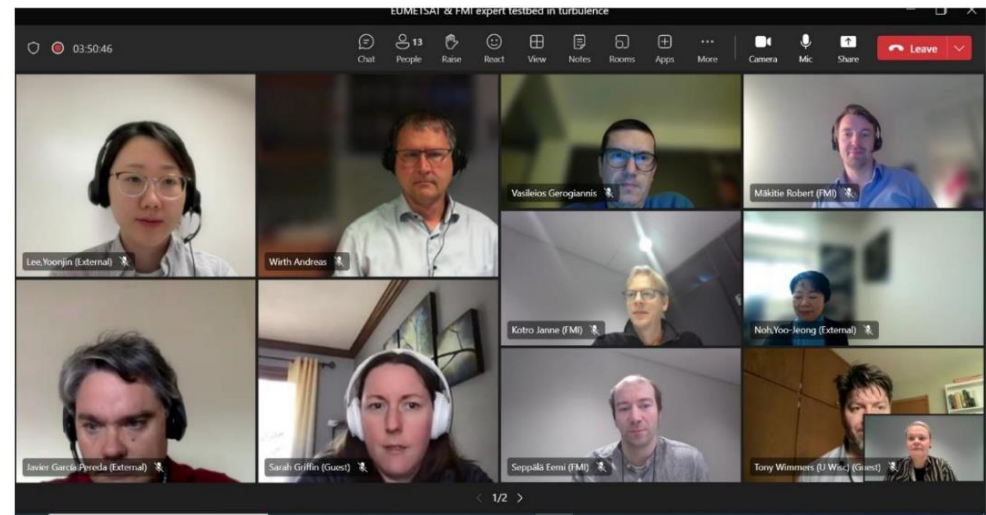
- 11 + 12 on-line

AviTestbed expert workshop on **turbulence**
online 21.3.2024

- 14 on-line
- Case study

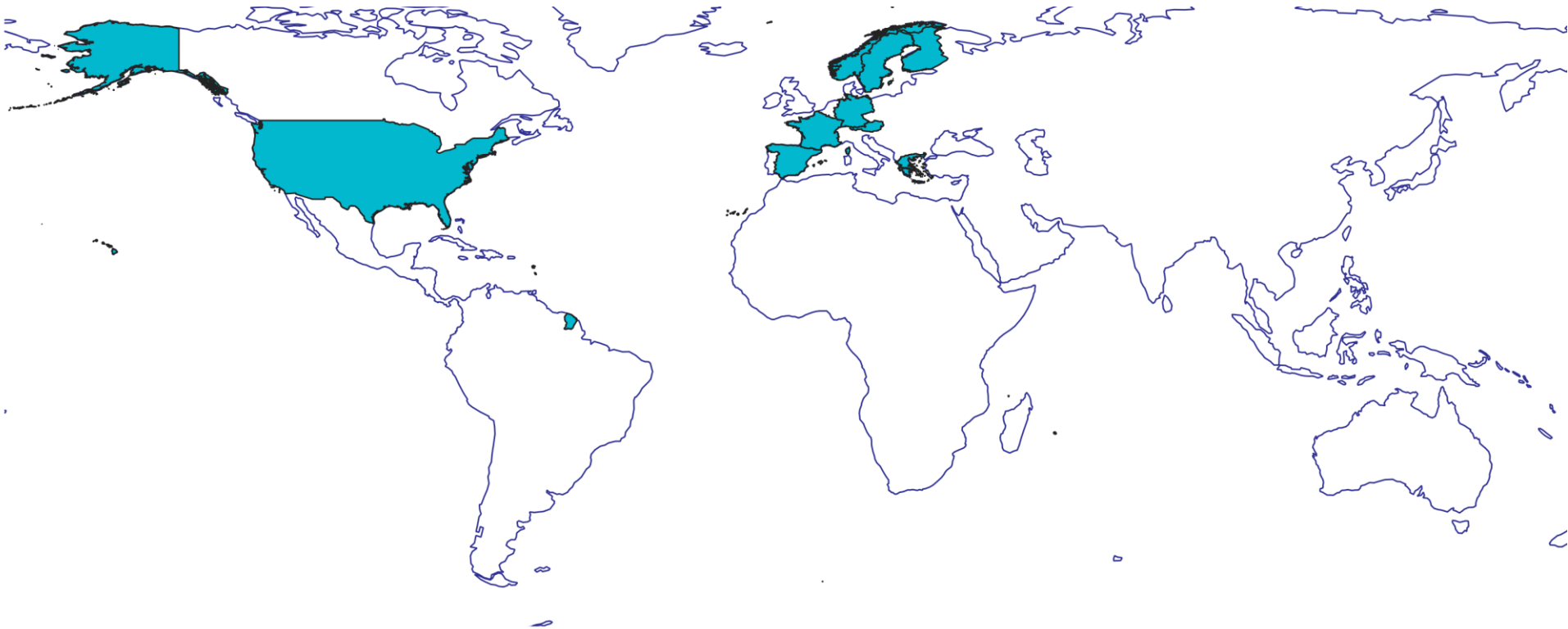


- *It was a good way to discover the different efforts in the different institutions for the detection of aviation turbulence.*
- *It was well-organized and overall I thought it was a great workshop.*
- *It would be very good that similar Testbeds can be organized in the future related to other forecasting tasks.*



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Expert Workshops participants 2022-2024



9 different countries from EUMETSAT, Meteorological and Hydrological Services and research:

DWD, SMHI, University of Marburg, Tecalia, University of Cologne, AEMET, Météo France, GeoSphere Austria, FMI, Austro Control, DLR, MET Norway, CIRA/CSU, CIMSS, Aristotle University of Thessaloniki



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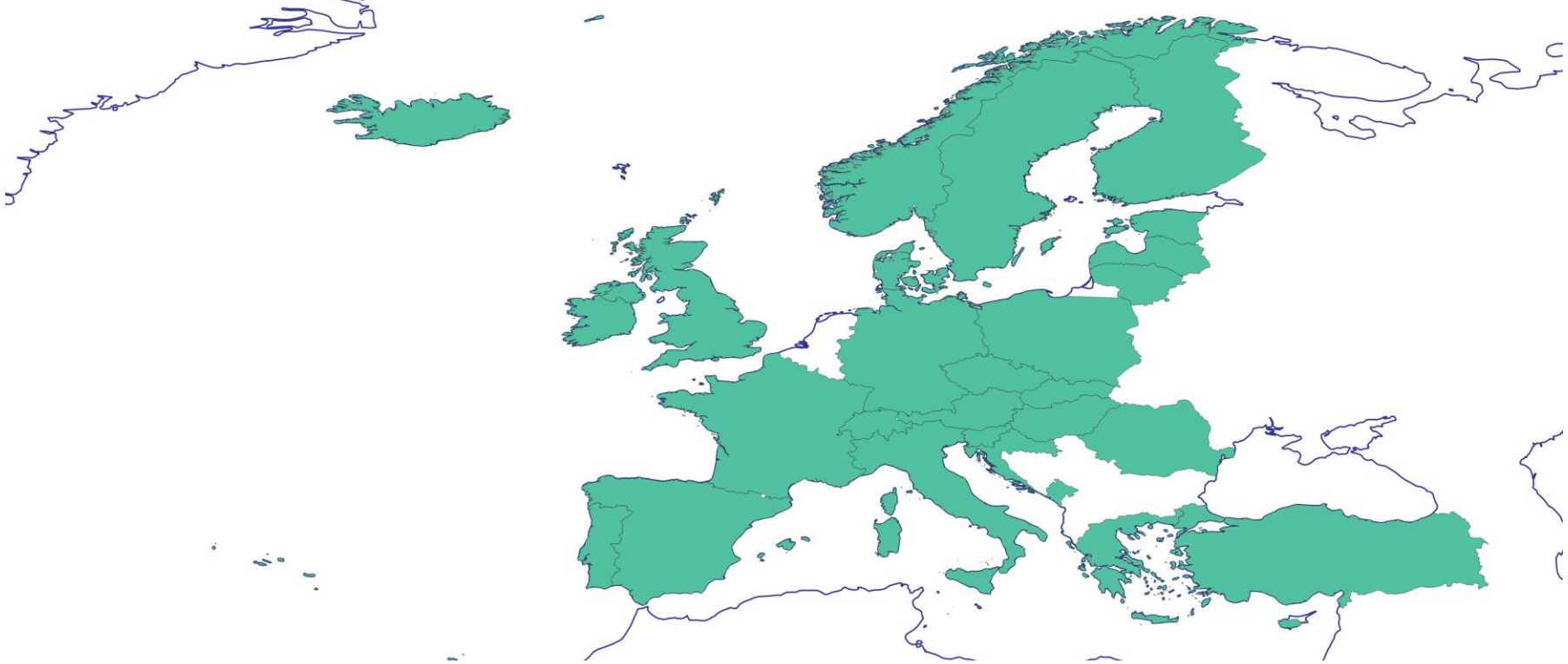
Forecaster Testbeds

Timeline

- 30.10.-2-11.2023
- 21.-24.5.2024



Forecaster Testbeds participants 2023-2024



51 Aviation forecasters from 28 countries:

Icelandic Met Office, Hellenic National Meteorological Service, Austro Control, Deutscher Wetterdienst, Estonian Environment Agency, Cyprus Department of Meteorology, Turkish State Meteorological Service, Serbia and Montenegro Air Traffic Service, Norwegian meteorological Institute, Latvian Environment Geology and Meteorology Center, Lithuanian Hydrometeorological Service, Slovenian Environment Agency, MeteoSwiss, Swedish Meteorological and Hydrological Institute, Croatia Control, Polish Institute of Meteorology and Water Management, Danish Meteorological Institute, Romanian Air Traffic Services Administration, La Agencia Estatal de Meteorología, Met Office, Italian Air Force, Met Éireann, Météo France, Czech Hydrometeorological Institute, Hungarian Meteorological Service, Portuguese Institute for Sea and Atmosphere, Slovak Hydrometeorological Institute, Finnish Meteorological Institute



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Forecaster testbeds

Time	Tuesday 21.05	Wednesday 22.05	Thursday 23.05	Friday 24.05
09 - 10	Workshop Kick-off at 09:00 Introduction of the project and the participants	Case Study Day 1: Icing Introduction to the cases (Robert Mäkitie)	Case Study Day 2: Fog Introduction to the cases and a fog case presentation (Robert Mäkitie)	Case Study Day 3: Turbulence Introduction to the cases (Robert Mäkitie)
10 - 11	EUMETSAT MTG and EPS-SG (Natasia Sterlec Mahovic)	Case study work session (Aviation Icing)	Case study work session (Fog)	Case study work session (Turbulence)
11 - 12	Introduction to satellite theory (Robert Mäkitie)	Case study work session (Aviation Icing)	Case study work session (Fog)	Case study work session (Turbulence)
12 - 13	Lunch	Lunch	Lunch	Workshop ending / Lunch (optional)
13 - 14	Challenges and limitations for satellite products (Juuso Paajanen)	Case study work session (Aviation Icing)	Case study work session (Fog)	
14 - 15	GeoWeb introduction and training (Robert Mäkitie)	Case study work session (Aviation Icing)	Case study work session (Fog)	
15 - 16	Present weather	Workshop discussion: aviation customers and satellites	Present weather	
16 - 17	Present weather	Workshop discussion: forecaster and satellites	Present weather	
Evening	Icebreaker event at FMI	Visiting the FMI operational forecasting room	Dinner	



EUMETSAT AviTestbed



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:Padlet

robertmakitie + 12 • 5 minuuttia

EAT24: Aviation Icing Session Morning

Lapland, Finland
Lapland, Finland

Kanta-Häme, Finland
Kanta-Häme, Finland

Grand Est, Frankrike
Grand Est, Frankrike

Wrocław, Poland
Ice girls - second post

Poland
Team EstRom

Team:DHL

Sounding from the Berlin shows potential icing 500hPa-700hPa and with temperature -12, if looking for wind direction icing is expected more NE from Berlin. SAF products shows low temperature and really high cloud tops. From synoptical situation - warm air some along

Yhdistyn kuningaskunta
Dublin
anti
Lontoo
Alank
Belgi
Suomi
Pietari
Sankt-Peter
Viro
Latvia
Liettua
Valko-Venäjä
Kiova
Kiiv

NWCSAF PRODUCTS used in forecaster testbeds

- ICING

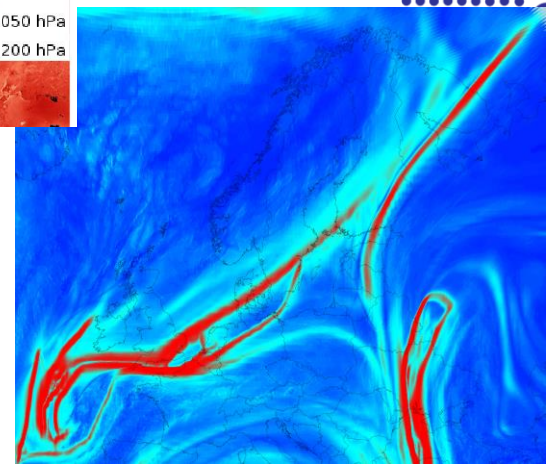
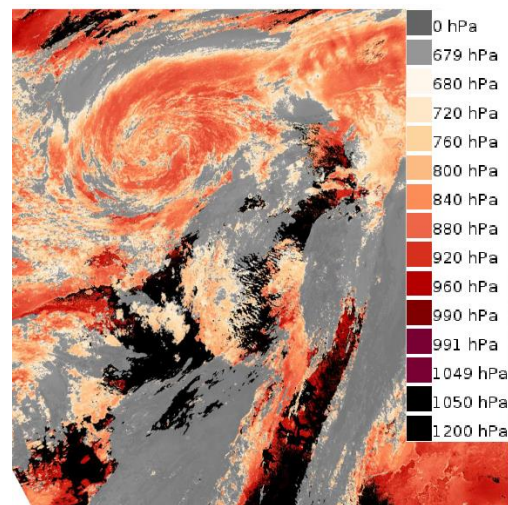
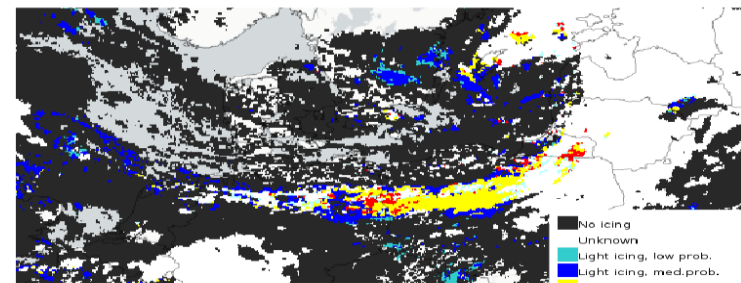
- Cloud top phase
- Cloud top temperature
- Supercooled liquid waterdroplets
- Ice crystals

- FOG & LOW CLOUDS

- Cloud type
- Cloud base PPS

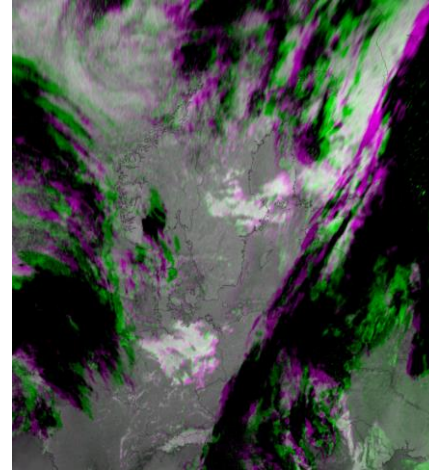
- TURBULENCE

- Probability of tropopause folding
- Probability for gravity waves
- High resolution winds

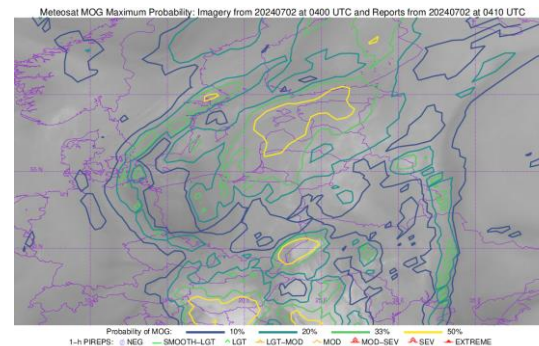


Other products

- FOG DYNAMIC RGB



- MOG (moderate or greater turbulence) University of Wisconsin

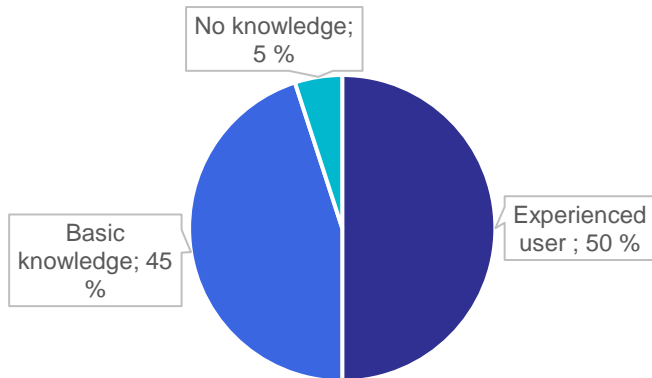


FEEDBACK RESULTS FROM THE PRE- SURVEY (2024)

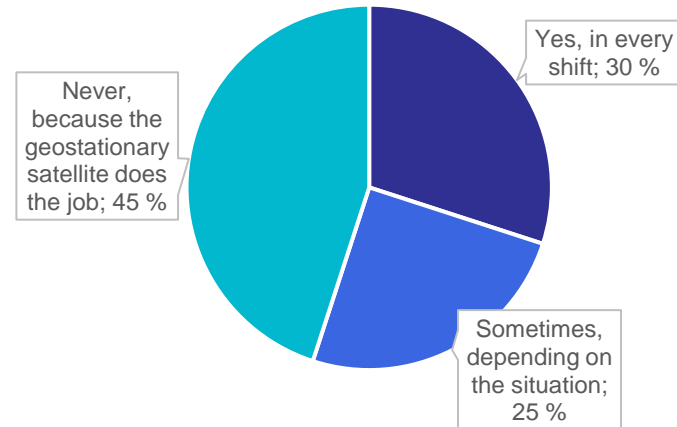


Results for pre-workshop questionnaires

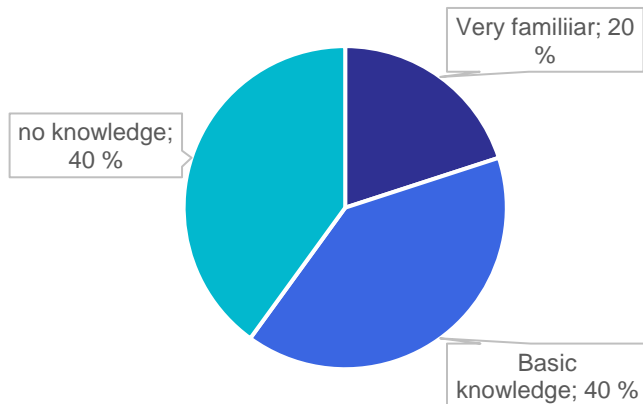
What is your satellite knowledge? Do you know how RGB composites are built, what every channel shows, knowledge of the instruments and its technical information etc.?



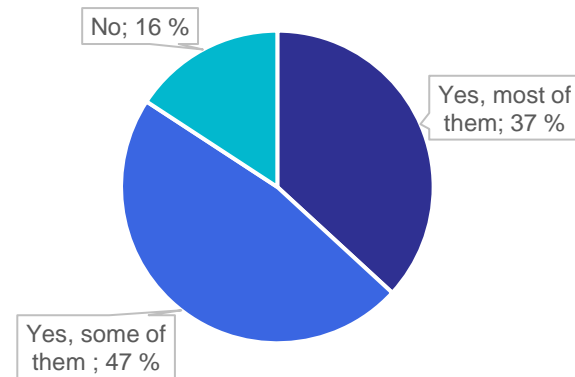
Do you use polar satellite products, when forecasting?



How familiar are you with MTG and METOP-SG, so called the new generation satellite from EUMETSAT?

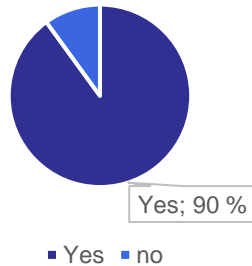


Are you familiar with NWC SAF satellite products?



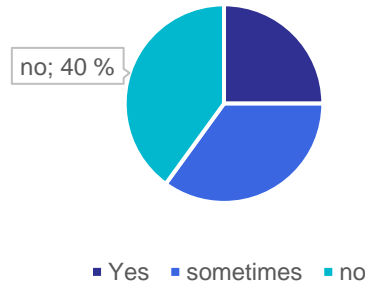
Results for pre-workshop questionnaires

Do you use satellite products to forecast **fog** and if so what products?



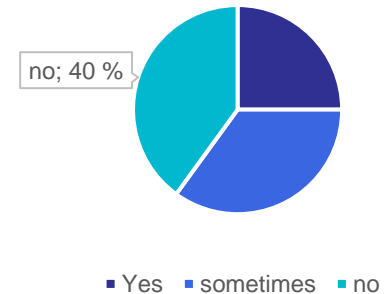
- Mostly different meteosat RGB-products (Day/Night Microphysics, HRV-clouds/Fog, different IR-channels)
- **2 answers involved NWCSAF cloud type or cloud top height**

Do you use satellite products to forecast **icing** for aviation and if so what products?



- Mostly different Microphysics RGB-products
- Few used Cloudtop-temperature from 10,8 channel, VIS or local products that combine NWP and satellite data (ADWICE)
- **One answer for NWCSAF cloud top height/temperature**

Do you use satellite products to forecast **turbulence** and if so what products?



- Mostly different WV, IR, VIS channels for locating jet/transverse bands
- **One answer for NWCSAF probability for tropopause**



FEEDBACK RESULTS AFTER THE TESTBED (2024)



By reflecting on your answers in the Pre-Questionary. How would you rate your satellite knowledge after this workshop? Did your satellite knowledge improve during the workshop?

- All of the participants answered that their knowledge of weather satellites improved, for many significantly, during the workshop.

I would rate my satellite knowledge as significantly improved after this workshop. The workshop increased my knowledge base and helped me gain a deeper understanding of satellite data. Through various practical tasks and discussions, I acquired new skills and insights into how satellite data can be applied in different fields

My knowledge improved, there are some product that I find really useful that I did not know that exists, and will probably make my forecasts better in the future.

Clearly better. Yes, I learned new things, I saw new products and I had the opportunity to use and compare these new products



Did you learn something new in the training? If so, what?

- 100% answered yes. highlighting the new ways to identify different weather hazards related to aviation using satellite data:

Now I know more about how I can use satellite products to forecast turbulence or icing. As well I learned more about new products.

I rarely used satellite products for icing and turbulence so I learnt about many new products.

Yes, I do. I learned how some satellite products work to identify supercooled water drops in the cloud, how to highlight the presence of fog with other product different from hrv fog and night microphysics. In the end, I have learnt new methods to identify turbulence via satellite.

I learned how to use some new SAF products and that it is very useful to look at different satellite pictures and products together as multi view.



Do you think you will use more NWC SAF products in the future?

Again 100 % answered yes.

I already use NWC SAF cloud type, height, cloud temperature and tropopause folding (these are available in our workstation). I will definitely use these and other SAF products in the future.

Definetely! I was getting used to using NWC SAF Cloud Type, but now I'm starving for all NWC SAF products!

Certainly, I anticipate incorporating NWC SAF products more frequently in my future work. The training session enhanced my understanding of their utility and potential applications, making them a valuable resource for addressing various challenges in my field.

Yes I will. As almost all of them work only under specific conditions it will be difficult to have the correct one in mind when on the shift in one of these situations. But after the workshop I think I have these situations in my mind...

Yes, definitely. Now that I know how to use them and what informations they may give me - it will be nice to compare my forecasts with the actual weather situation or try forecasting while using those new NWC SAF products a bit more.

Definitely. The products are really handy especially for nowcasting and they will be of great help during a busy shift.

Yes, I'm using them now extensively, will use them in the future and **I look forward to see more products becoming operational**

Yes I definitely will. I didn't know that much about them before and didn't really use them before. I mostly used basic satellite imagery. However, now I have played with some products and understand a bit about how they are made and what they should be used for I will definitely use them, and also encourage colleagues to do so too.

Do you think you will be using more polar satellite images in the future?

Because of the location of my country, I was generally using geostationary satellite images, but with this course I'm more knowledgeable about polar satellite images. So, yes! I'm eager to use them!

Yes, I anticipate using more polar satellite images in the future. These images offer unique perspectives and valuable data that can enhance various analyses and applications.

They are useful, but we don't have a direct access to polar orbiting satellites and for my country I think they are not as useful.

As before, but more the new ones

Even more sure!! I wanna go back and try to make it more "easy" to access data, but also spread the word to colleagues, that it is actually not that hard. And that it has huge potential.

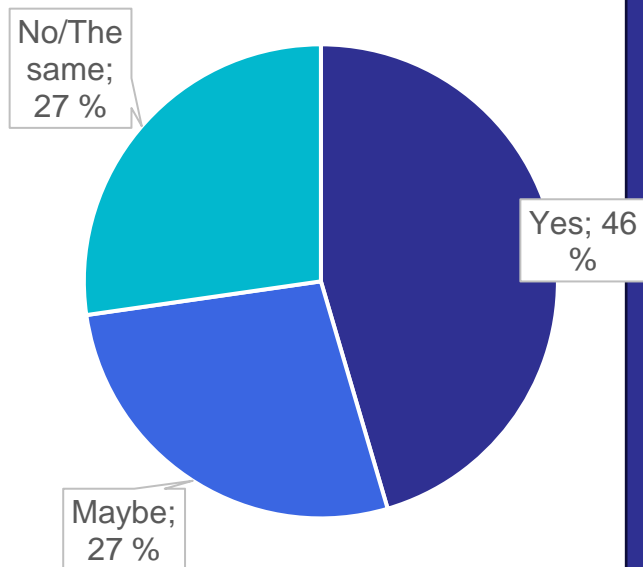
We currently do not use polar satellites but plan to use in the near future.

I will try to use them since I have seen the potential they offer.

I honestly don't know. Their spatial resolution is great but their time resolution is not so unless we can have more images a day, I don't if they will be very useful to us.

I'm not sure about that. I already do, but as I come from south Europe, the passes should be more to use polar satellites. Besides, the expected resolution from FCI is already fine

As of now it is hard to increase the use of Polar satellites, an image is always visible.



Was there a new interesting product or RGB composition you liked a lot?

I cant say that there is only one product is New and interesting to me. The name of the course is test bed, so every product we encountered was New to us and all of them are interesting. All of them fascinated me

Fog IR difference- Cloud top temperature- Cloud phase- Tropopause Folding

High Resolution Wind- True Color RGB- Cloud Type RGB- Supercooled Water Droplets

Fog dynamic RGB difference

Yes, especilly:- supercooled water droplets product- tropopause folding- experimental cat product- low level moisture product - this one would be really good and helpful for my country personally ;)

Defenetly, ICING product for see the supercooled water droplets. And a second for me is Dynamic fog.

SAF NWC Cloud Type.

Cloudphase, cloud top height. Also liked the fog dynamic difference a lot.

Cloud type differentiation and Thin cirrus detection work really well.

I found very interesting NWC SAF supercooled water droplet and RGB composite cloud phase and cloud type. Furthermore, in my point of view the ASII products to identify gravity waves and tropopause folding are very useful.

I liked the Tropopause folding product and MOG probability, because the seemed pretty accurate in the case studies we had in the course.

Tropopause folding and ASII products.



Free comments from the participants

"I believe it is a fundamental experience for training aviation forecasters on the use of new products. Furthermore, it gives you the opportunity to meet other forecasters and share professional knowledge and experience."

"I just can thank to you. I cant explain how this course was helpfull. Seriously. I cant wait to apply them on my daily work. There is one thing makes me annoy. Let us full access to FMI Geoweb. Pls pls pls. I need this application. Dont close to us after 3 months later! Pls. "

"I really enjoyed the flexibility of the workshop and the different themes each day. **This meant that we could concentrate on one aspect of the weather each day.** I have attended other Testbeds and they are often too full of content and testing, with different themes through the day. This was more relaxed, but still had plenty of information and content, as well as plenty of time to test the products. The fact that we will have access to geoweb afterwards is brilliant and I will try and use it back home. All of the trainers were really knowledgeable and friendly, and it's actually one of the best run workshops I've been to."

I think It was great and I can't wait to attend another workshop. :)



RESULTS FROM THE PRODUCT SURVEY



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1.ASII - ICE Product Survey (Super Cooled Water Droplets and High Altitude Ice Crystals)



1.1 What are your thoughts about the ASII Icing products (Super Cooled Water Droplets and High Altitude Ice Crystals)?

They are good products because their use help forecasters to identify the vulnerable areas at a glance.

First product (soopercooled water droplets) would be a huge help as an additional data while forecasting potential icing or verifying situations that already hapenned. Good operational tool. The second one whouldn't be that hapeful in a daily work at this stage - (to little informations).

Looks very good in situations of frontal icing, and also good for icing situations that have come lately where there has been reported about icing in higher altitudes in lee clouds

Both products give more information about icing events. In combination with other they seem useful. There should be a way on to get informations about the kind of icing that occurs. Is it possible to reduce the use of colors?

Super Cooled Water Droplets seems like a good product! What is the difference between no icing and unknown. Or, actually I just mean, is there a point to have no-ice? Because it takes up a lot of pixels. If it wasn't there, then you could more easily but eg an true color rgb under neath just for visualization simplifications.

very useful products for detecting icing. It would be better, if the super cooled water droplets product could identify also CB clouds. I dont see many benefits using high altitude ice crystal product jet.

I think they are handy but should be used carefully as there are a few limitations to them. For example the fact that they only provide information about the cloud top could be problematic when dealing with layered clouds

This is a good product but we must use with other product because on the convection situation this product is less usefull than in a non convective situation



1.2 Do you see it being useful while forecasting? If not, why?

They are useful while forecasting especially when they are combined with other products

Yes there is great potential.

Why not. Lets wait for the official version

High Altitude Ice Crystals product at a glance seems to overestimate icing in high altitudes. That's why I would hesitate to forecast this phenomenon according to this product. The super Cooled Water Droplets Products seems ok. I want to test it in different situations

Yes. Needs additional information , sounding, obs, etc. to support the calculated data

Yes. With the work load we have during the shift, it is essential to have a tool that quickly identify if there is ice or not in a region. However, after identifying this region, it is necessary to deepen its analysis.

I think so! needs practice like all the other products. I am not sure how much value the high altitude crystals image gives. Honestly I have never heard of it to be a problem for aviation.

They may be useful while forecasting, even while there are some bugs which have to be corrected, such as for example the fact that, in some cases, you have to zoom in the pictures to eliminate large areas with black noisy signal.

2. Fog Products (Fog Dynamic RGB, Ceilometer Backscattering and NWC SAF Cloud Base)



2.1. What are your thoughts about the fog products (Fog Dynamic RGB, Ceilometer Backscattering and NWC SAF Cloud Base)?

Fog RGB products look good and could be very useful when the sky is clear of other clouds which is of course not always the case. Ceilometer backscattering is useful and used at my institution. **NWC SAF Cloud Base could also be very useful together with other products.**

Fog Dynamic RGB works really good (using the difference). The ceilometer could be improved, maybe the new ones give us a great information. **The NWC SAF Cloud Base will be the one of best tools (when it works), i think that we need to improve it and collaborate with the developing group (testing, past days, needs, etc)**

Fog dynamic RGB seems to be quite interesting, easy to use and one more tool for FG which is quite challenging for aviation. Also the data from Ceilometer is interesting but ti need more knowledge about it. **SAF Cloud Base might be interesting but if prove to trust in it.**

Fog dynamics RGB- good to see fog developement. Ceilometer backscattering- first time using it, very useful way to analyse cloud ceiling. **NWC SAF- very useful tool detecing low clouds.**

Talking about Fog Dynamic RGB, I think that this is a good channel to recognise a fog, but not for every cases. It's depends on case area. I think the best channel is a old good microphysics channel. Ceilometer also is very a good product which could help for eastern European countries. And **NWC SAF Cloud Base product is good, but not for southern Europe.**

I think the fog products are handy but I found the **NWC one a bit confusing with all the different pressure levels being use to estimate the cloud base.**

First of all I'd like to say that I'm seriously sad to not have a Ceilometer Backscatters, I guess that pain express to you well how I find usefull the it. Fog Dynamic RGB is definitely a thing but as we saw on the course it gives hard time when there are high level clouds. I especially say this for Fog dynamic difference rgb. And when we come to the **NWC SAF Cloud Base, yes it is promissing but still it should be trained and learn from different cases to improve itself.**



2.2. Do you see it being useful while forecasting? If not, why?

Yes, in a nowcasting forecast. About polar products- they aren't much of a help for lower latitudes (2 pictures for a day so they won't be used as a basic tool))

Of course yes, any information regarding visibility/fog/low clouds are welcome and in operational chain should be take into account.

Yes. I think they are all useful while forecasting with the exception of the NWC one. If the product was able to show the cloud bases in ft instead of HPa, it'd say it'd be better

Fog Dynamics RGB: If there are also onyl few clouds above the fog, the signal for fog dynamics is not clear. It is better visible in microphysics RGB. NWC SAF Cloud Base: Added Value for this product is not clear for me yet: It works only when the model performs well. If the model does not perform well, the SAF Product will give no/wrong information. So why should I not use directly the model data?

Fog dynamic is nice to look when you need to track fog development, so I would like to use it. SAF product is interesting, but there is limitations - one image for long period of time for certain region

I think the fog dynamic and cloud base products seem the most useful at the moment, with fog dynamic being good for spreading and dissipating of fog. The cloud base when used in conjunction with other satellite products could be good for finding areas of fog and distinguishing it from stratus. I would like more time to use them in order to get a more detailed view though!



3. Turbulence Products (HRW, Turbulence MOG Probability, ASII - Tropopause Folding and ASII - Gravity Waves)



3.1. What are your thoughts about the turbulence products (HRW, ASII - Tropopause Folding and ASII - Gravity Waves)?

They are very useful for turbulence nowcasting. I find especially useful the Tropopause folding and GW products.

think it's a great product to help recognize and more to analyze tropopause, gravity waves and high resolution winds.

Very interesting and promising products. I am looking forward to using them in operations.

In my point of view, these products are very helpful to identify areas with CAT and Gravity Waves when there is not a good visibility in satellite images.

In our country satellite images are rather supportive data while forecasting turbulence. After this training I think it should be changed, especially when it comes to forecasting CAT, where we don't have many datas and it's really demanding/hard to do especially for junior forecasters with small experience. From my perspective - CAT EXPERIMENTAL product will be the best help also tropopause folding product.



3.2. Do you see it being useful while forecasting? If not, why?

The products are useful. Grafity waves has to be more correlated to the waves seen in sat images. The meaning of the probabilities should be stronger related to L/M/S categories. Especially the kind of aircraft has to be concerned.

Yes, I see it being very useful.

Yes, I think is very useful. From this lecture I learn more about turbulence products which I can use and adjust to my work.

Very useful indeed. The forecasters does not waste time and time most of the times is valuable

It is absolutely useful for us to forecast turbulence. Turbulence products provide us to predict turbulent areas and this will help pilot to make safer flights.

yes, I think I'm enough qualified to answer that question because like I said in the first question I'm not familiar with turbulence prediction. But according to the example I encountered at the class, I can say that yes they are useful



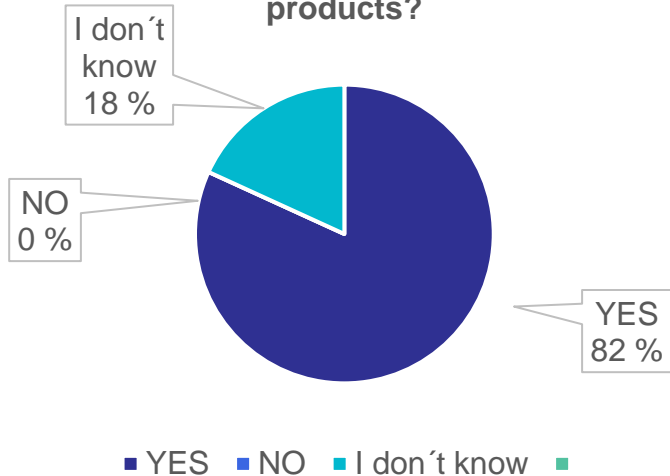
RESULTS FROM THE POST-TESTBED SURVEY



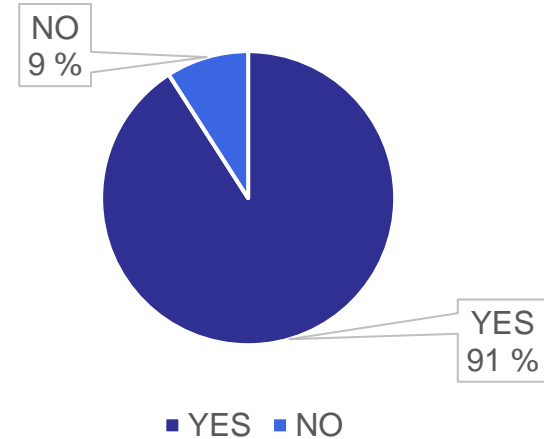
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2023 POST-SURVEY

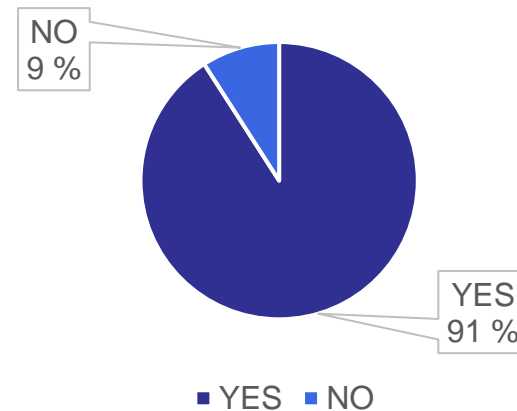
After the testbed have you felt more comfortable using different satellite products?



In your daily work, have you benefitted from the theory sessions regarding weather satellites?
(general introduction to MTG & METOP-SG, generation of RGB products, challenges/limitations of weather satellites)

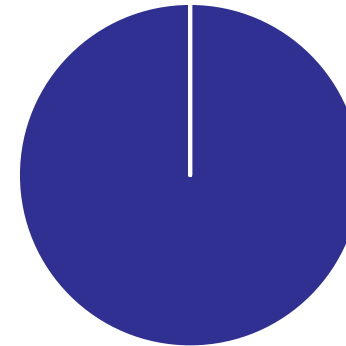


In your daily work, have you benefitted from theory sessions on different aviation related topics?
(fog & low-clouds, icing, turbulence)



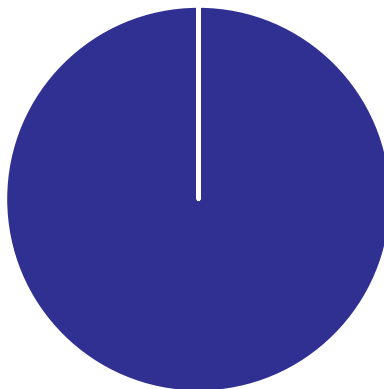
2024 POST-SURVEY

In your daily work, have you benefitted from the theory sessions regarding weather satellites?
(general introduction to MTG & METOP-SG, generation of RGB products, challenges/limitations of weather satellites)



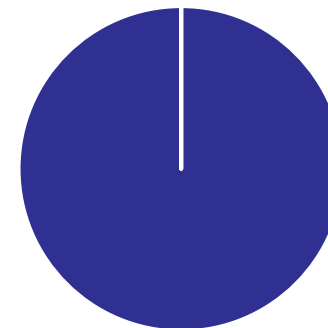
■ YES ■ NO

After the testbed have you felt more comfortable using different satellite products?



■ YES ■ NO ■ I don't know ■

In your daily work, have you benefitted from theory sessions on different aviation related topics?
(fog & low-clouds, icing, turbulence)



■ YES ■ NO

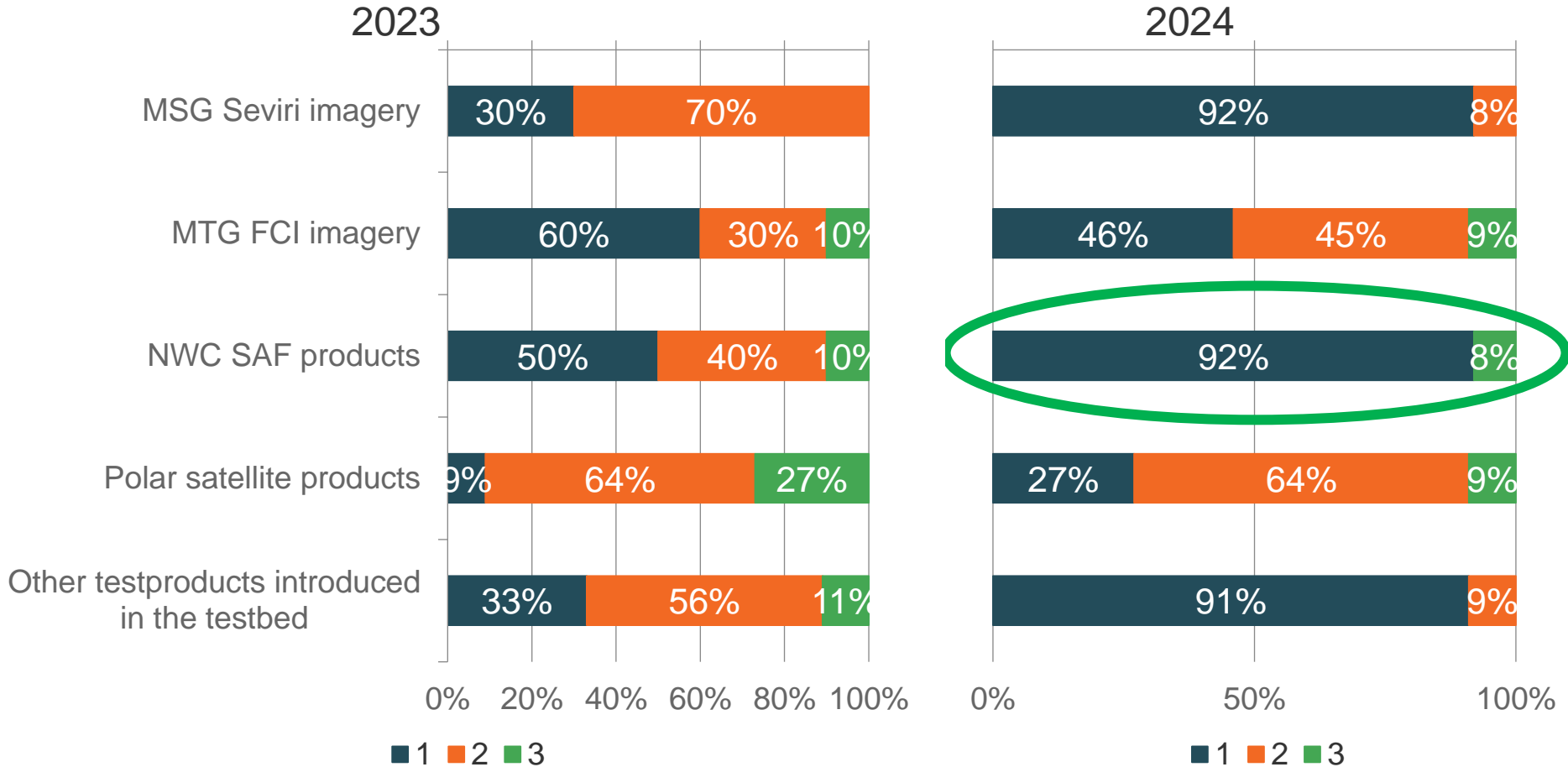


After the testbeds have you seen changes to the use of the following satellite products, when forecasting:

1) Increased or more detailed approach

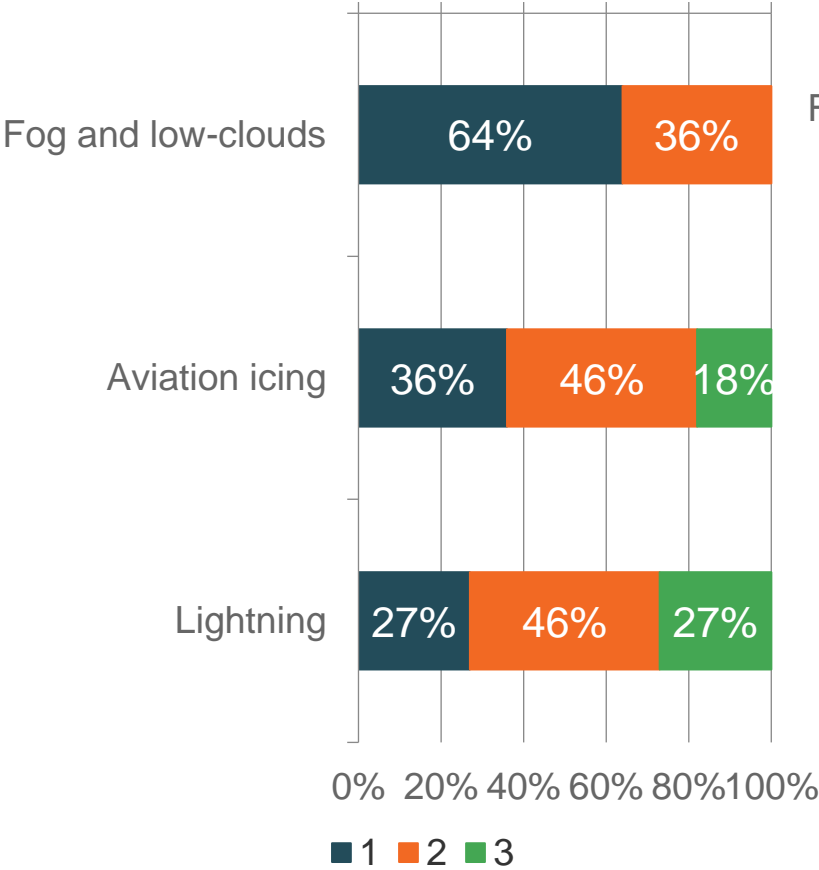
2) No

3) Don't use as much as previously?

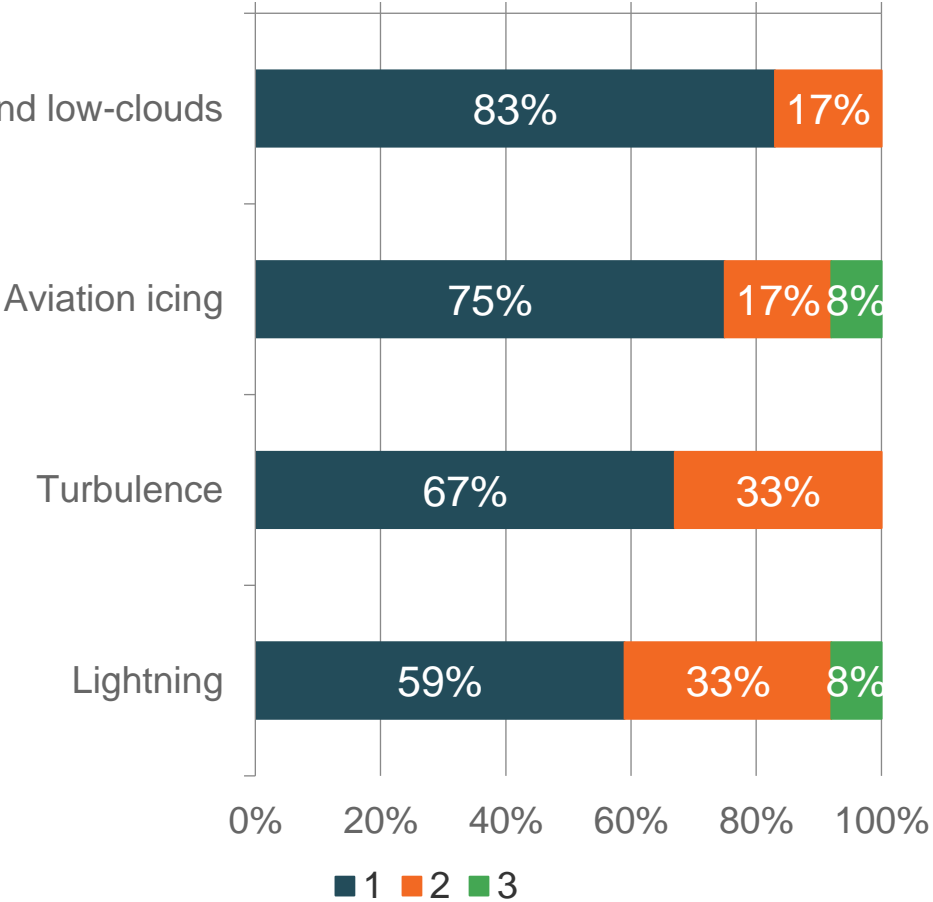


Do you use satellite products to forecast the following phenomena:
1) yes, including new products shown in the testbed
2) yes, I use the same products as previously
3) No

2023



2024



Is there another aviation related topic that comes to mind on which you would think that different satellite products could be useful?

Responses

Mountain waves

Dust versus volcanic ash

Cbs, thunderstorms

Convection

Sand-/Duststorms, cold drops and the effects on ground management (taxiway/runway) by strong precipitation/flooding

Updrafts and downdraft areas (behind mountains and due to convection)

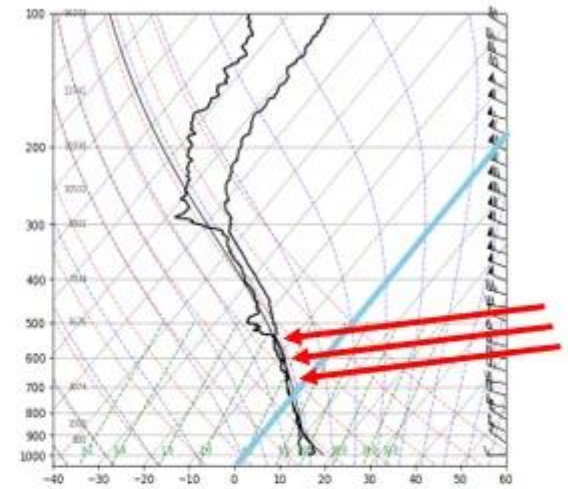
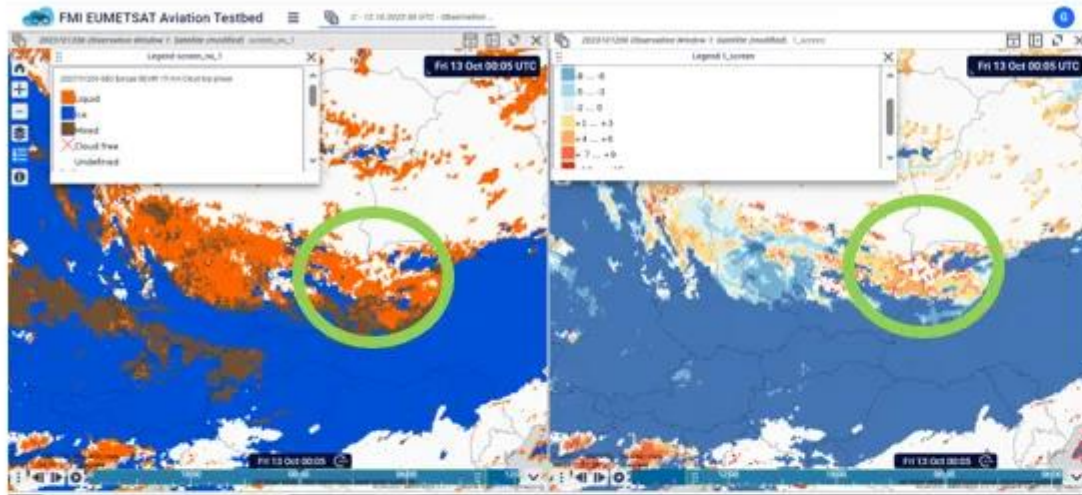


PADLET ANSWERS

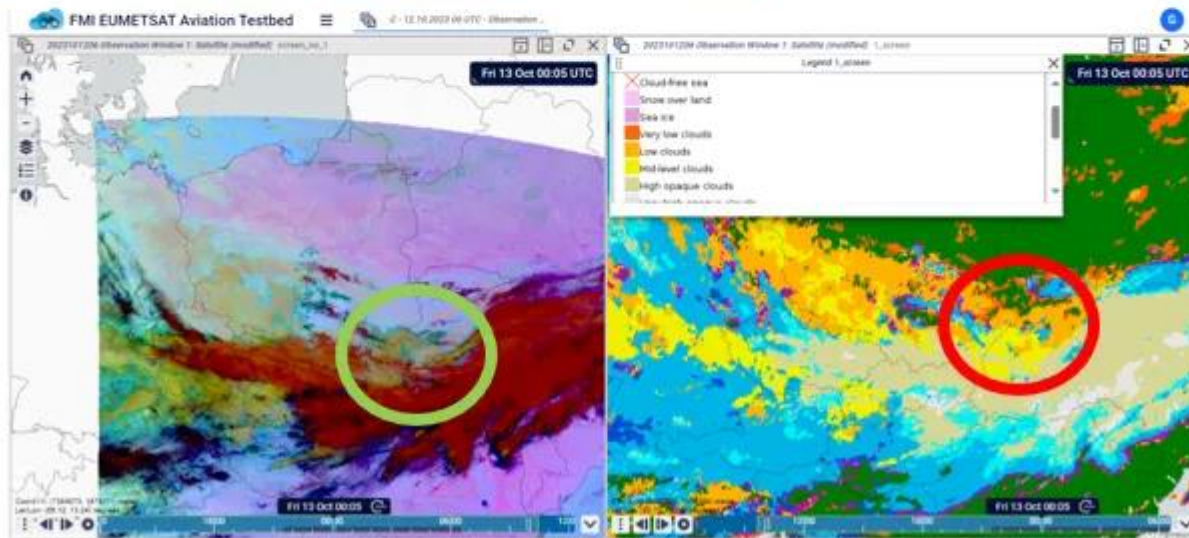


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Station 12575 starting 2315Z 12 Oct 2023



University of Wyoming Atmospheric Science

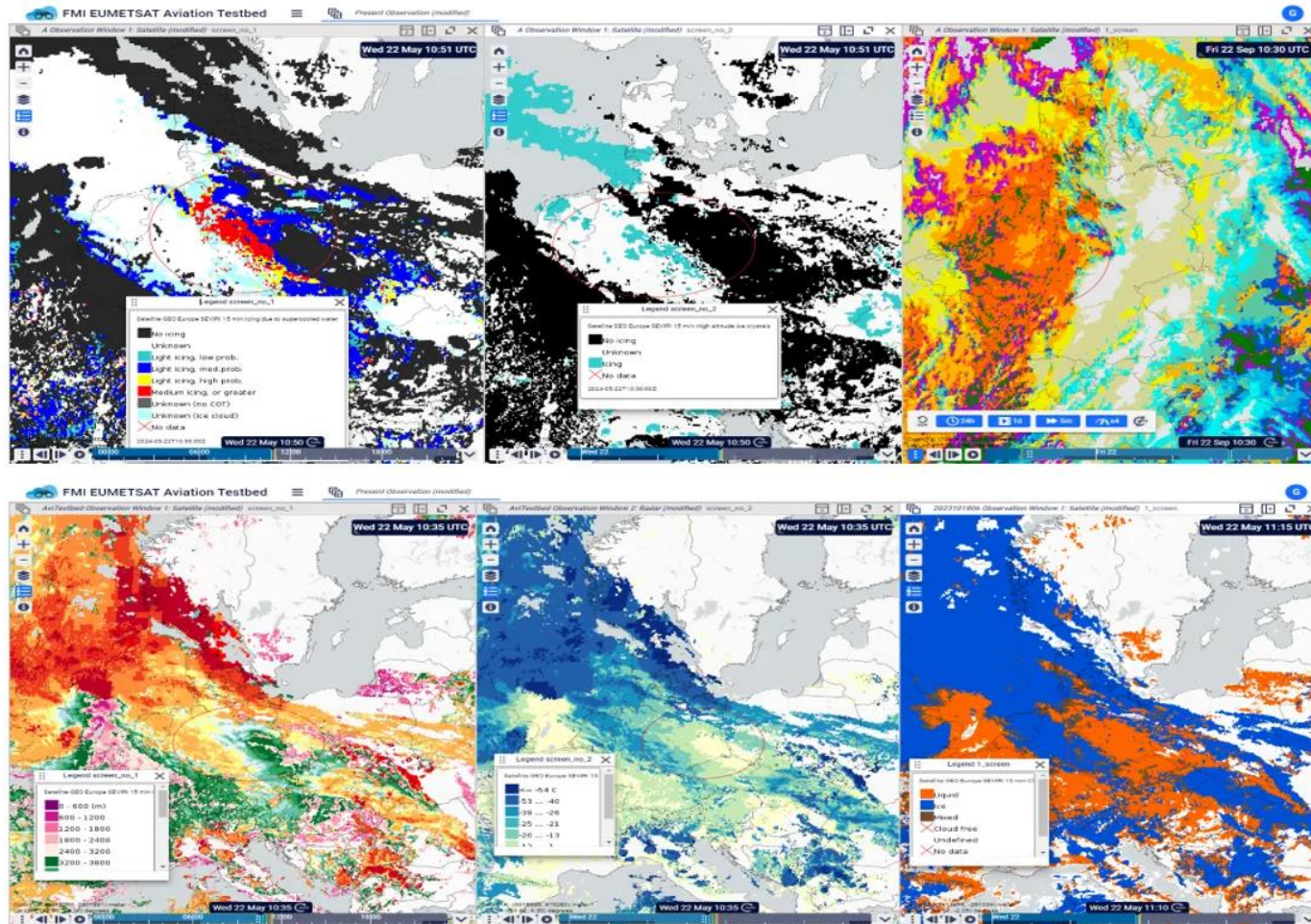


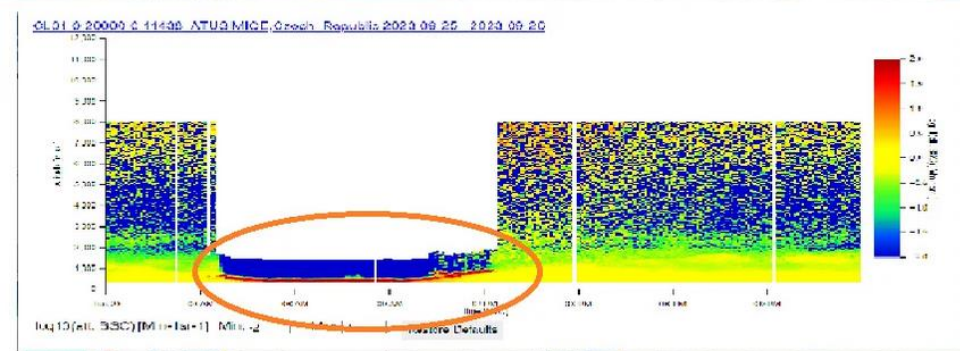
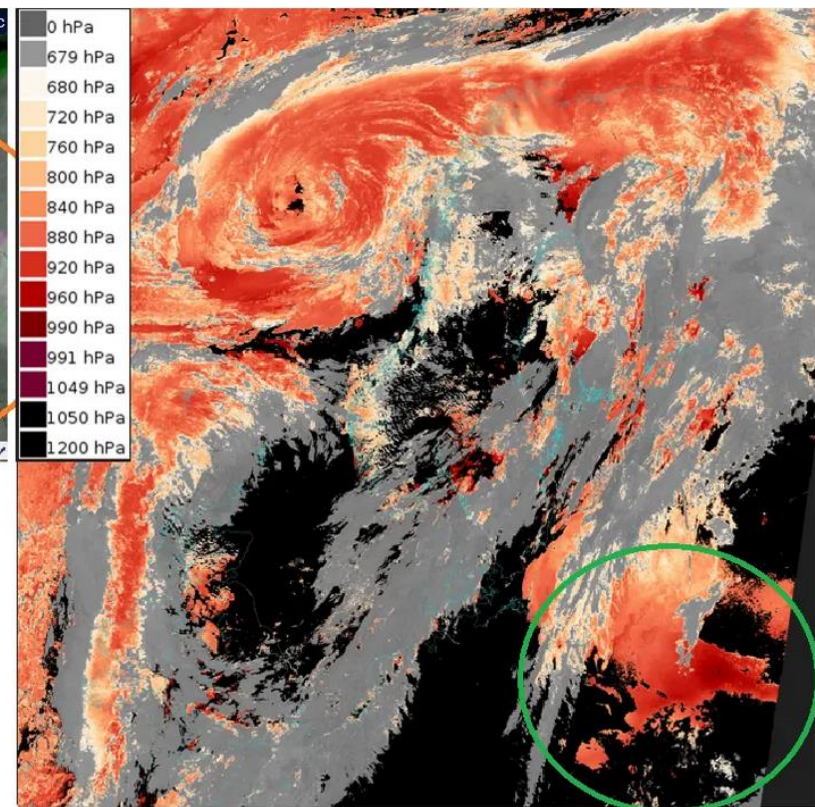
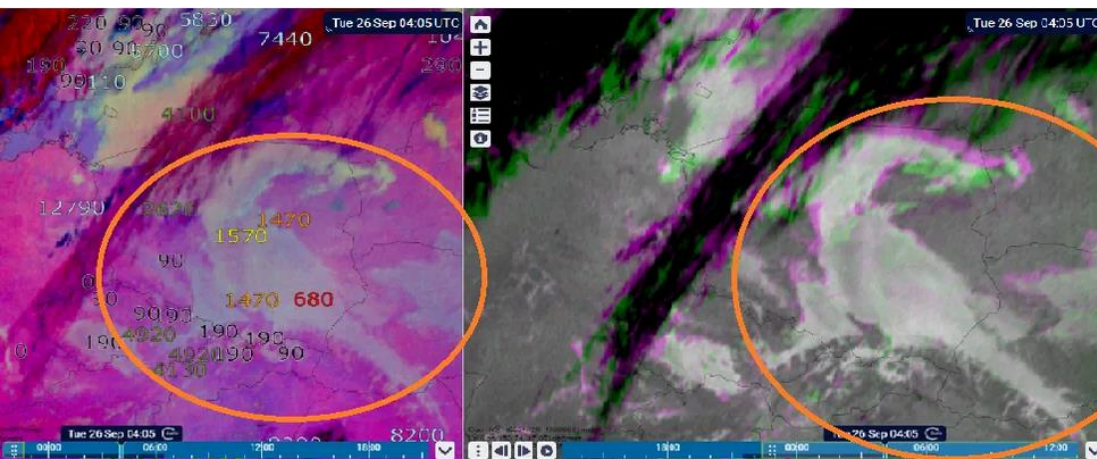
Ice Girls 2nd Example

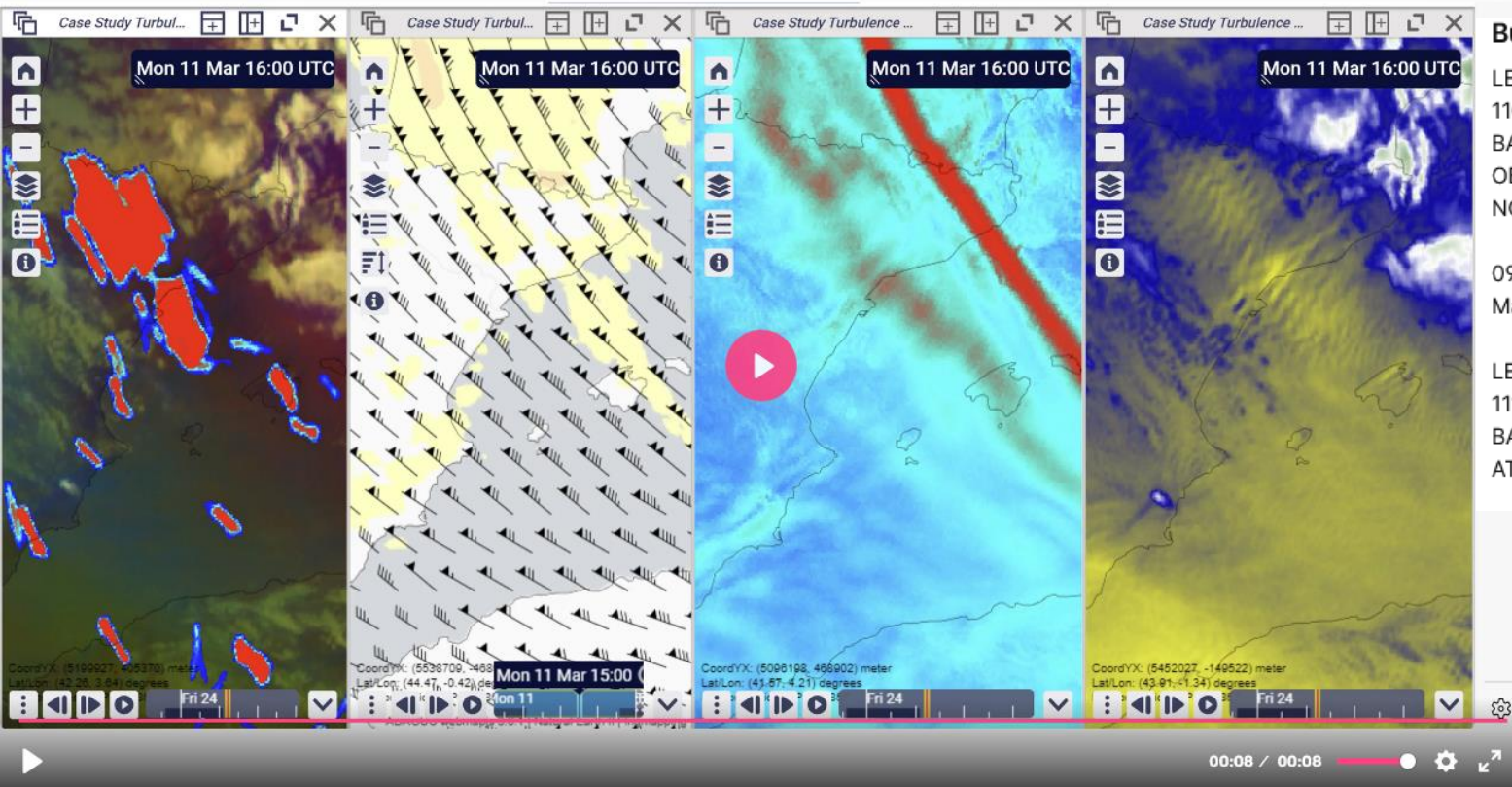
22th May 10:35 Germany/ around Hanover

- 1- Icing due to supercooled water: Medium Icing can be seen around the Hannover
- 2- High Altitude Ice Crystals: Icing can be seen at the same time at the same time
- 3- Cloud Type at NSW SAF: mid and low level clouds can be easily seen
- 4- Cloud Top Height SEVIRI: height is suitable for icing
- 5- Cloud Top Temperature: Requirements for icing was met
- 6- Cloud top Phase: Liquid

Location
Germany







Bumpy ride sigmets

LECB SIGMET 1 VALID
110620/111000 LEVA- LECB
BARCELONA FIR/UIR SEV MTW
OBS AT 0617Z SFC/FL370 STNR
NC=

09:27 Airmet TURB MOD over
Mallorca

LECB SIGMET 4 VALID
111500/111800 LEVA- LECB
BARCELONA UIR SEV TURB OBS
AT 1429Z FL220/270 MOV E NC=

Bumpy ride

SEV TURB OBS at 15:00 near
Barcelona. All products agree,
high probability of gravity waves,
100KT winds blowing over
mountains at FL300, MOD PROB
of TURB, folding of the
tropopause (ca. 30.000FT) and
lee waves seen on WV image.



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PLANS FOR 2025

SPRING

- 18.3. EXPERT WORKSHOP ON **VOLCANIC ASH** ONLINE
- 5.-9.5. FORECASTER TESTBED IN HELSINKI

AUTUMN

- EXPERT WORKSHOP ON **CONVECTION/LI** ONLINE
- 27.-31.10. FORECASTER TESTBED IN DARMSTADT
- CUSTOMER WORKSHOP



Conclusion

- Fourth year of the project started
- This year we will have new expert workshops on **Volcanic ash** and **convection/LI**, two forecaster testbeds and one customer workshop online.
- Geoweb has been an important part of the project allowing animation of different satellite images in real time and blending RGB-products with other observations and comparing products side-by-side.
- Positive feedback from the topics presented, theory sections with the focus on hand-in learning with enough time for case studies, which has helped participants to take the new products to further use.
- Really good reviews on the possibilities of the new MTG RGB-products as well as the NWC SAF products that can highlight the specific phenomenon that the forecaster is observing.



Reactions from the first AviTestbed as the pre-pre operational FCI data became available on 1st of November 2023 and could be viewed from the Geoweb .





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Thank you for the interest

Questions? Comments? Suggestions?

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27.2.2025

Eemi Seppälä

