

Met Office User Forum

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Venue Met Office HQ, Exeter
Date/time Monday 25th November 2024, 1100, to 1500

Agenda

- 1100 Agenda Item 1: Welcome & Introductions
- 1115 Agenda Item 2: International activities:
- WAFS
 - VAAC
- 1145 Agenda Item 3: Finances
- 1200: Agenda Item 4: National Aviation service, this year featuring:
- Update on Aviation Visualisation Services & aviation data
- 1230: Agenda Item 5: Lunch & visit to Ops Centre (1 group at 1230, 1 at 1300)
- 1330: Agenda item 6: Aviation R&D:
- Current activities
 - Proposed future plans
 - Update on Supercomputer
- 1400: Agenda Item 7: 3 month weather outlook brief
- 1420: Agenda item 8: Specific issues raised by attendees
- 1450: Agenda item 9: Any other business
- 1455: Agenda Item 10: Date of next event

Close

Agenda Item 1: Welcome & Introductions

Mark Gibbs welcomed everyone to the meeting and explained the purpose of the meeting. Noting the new approach to invitations was necessary as the group had dwindled in number. It was deemed to have been successful, despite Storm Bert on the preceding day meaning some attendees had to cancel, numbers were increased and discussions reinvigorated.

A copy of the slides presented are available on our public website to use alongside these minutes.

Agenda item 2: International activities

- **WAFS: World Area Forecast System**

Last week was the 40th anniversary of WAFS provision, Mark laid out how this service has developed over time and provided an update on recent progress made on upgrades to WAFS data, as determined by ICAO.

Mark informed the group that in January 2025, WAFS charts will move from being hand drawn by a Forecaster, to an automated system and their format will change, this has the benefit of being able to introduce additional time steps, and for the new times steps to be available earlier. Example shown to attendees and reasons behind the changes explained. The charts won't be a replica; they will be an objective view of the atmosphere. Meeting asked, "will a human overlook the data". Answer was "no" as the verification period proved they were as good if not better than the previous production method. Bases of cumulonimbus (Cb) will no longer be marked as they rarely occur at the altitude represented on these charts. Existing charts will run in parallel until 2028. Embedded Cb will not be explicitly included only OCNL (occasional) Cb and FRQ (frequent) Cb. Met Office website details the changes:

[World Area Forecast System \(WAFS\) - upcoming changes - Met Office](#)

- **QVA: Quantitative Volcanic Ash**

Previously Met Office provided VAA (volcanic ash advisories) which had limits to drawing a precise area of risk (known as a polygon). QVA is the future direction and builds on concentration charts, to put more data into the users' hands.

Mark provided an update on the progress of enhanced volcanic ash data services via API. Currently volcanic ash advisories and graphics are provided for 'discernible ash'. A new product (QVA) will be introduced alongside Amendment 81 to ICAO Annex 3. The QVA service will comprise of a gridded dataset showing the most likely trajectory of ash based on different concentration thresholds as shown in slides. Probability will be represented alongside a deterministic output, to allow user

judgement to be made. UK MO will use its 18-member global ensemble to do this. Flight level ranges will increase. Spatial and temporal resolution increasing too.

QVA API will be available June 2025. The old concentration charts will be phased out, potentially ending in 2026 but date will depend on how transition goes for stakeholders. VAA will continue to be produced until at least 2030.

It is anticipated that the service will allow airlines to utilise threshold data relevant to their aircraft, to proactively route to avoid areas of risk to engines.

Questions invited; 1) “what if you have a power cut” Answer: Met Office buddy production system explained, and Met Office HQ resilience touched on. 2) “what if end user miss an issue” Mark explained missing an issue would be difficult due to how these are ingested.

Agenda Item 3: Finances

Mark explained this section is a requirement on the Met Office and provided a brief summary of the costs associated with the delivery of the Met Office’s regulated aviation commitments over the course of NR23, as agreed with the CAA and following Industry consultation. The Met Office’s cost submission (as presented to Industry) has been approved and details may be found in [CAP2553b NR23 Review: UK performance plan Decision on DfT, Met Office and CAA en route costs](#). The costs for the period of NR23 include an agreed contribution to National Capability and International Subscriptions including observations, particularly satellite-based observations.

2023 actual versus determined costs presented, this was 2% under what was budgeted (mostly due to scaling down services during COVID and this being readjusted as air traffic volumes increase). Any excess budget is retained for benefit of future services.

2024 and 2025 presented as per slides, showing the continued investment in the development of information services and life cycling of legacy systems.

Content from the European satellite programme provides 76% of the relative contribution for a global 24 hour forecast. Hence why the Met Office fund satellite programmes. Met Office are required to make a 2.5% efficiency saving per year. This was noted in relevance to how costly it is to maintain human input to WAFS and the aforementioned changes to reduce this.

Additional services and development noted as per slides. E.g. embedded NATS team, refurbishment of Volcanic Ash observing network, redevelopment of visualisation services (MAVIS)

Agenda Item 4: National Aviation services

- **Update on Aviation Visualisation Services & aviation data**

Lauren provided an update on the work of the Met Office, in partnership with a technology solutions company (BJSS), on a programme of work which includes amongst its deliverables the re-platforming of the Met Office's existing aviation briefing visualisation services, comprising the (7 users specific tools) including relevant to this meeting: [Aviation Briefing Service \(ABS\)](#), HeliBrief, Network Weather Resilience (NWR) and Open Runway.

Whilst this activity is driven by aging infrastructure, it presents an opportunity to modernise our services for Regulated Aviation.

The new system will be called Met Office Aeronautical Visualisation Information System, MAVIS, which gives an appropriately descriptive acronym but is also a nod to supercomputer pioneer MAVIS Hinds. A base layer of info will underpin MAVIS and all users will get this. As we have groups of users with specific needs, MAVIS will have layers to ensure all groups get what they need. It will be "mobile first" to acknowledge how most users access it. Summer 2025 a public BETA version will be launched and quarter 1 2026 migration is planned to be complete. QR code shared with group to allow them to access a very early BETA version for 24 hours and feedback encouraged.

Pinning of sites and favourite map layers shown. New model data will be signposted, so you know how old it is. Users can set their own operational thresholds. Some information for sites that aren't aerodromes will be input, useful for search & rescue and gliders. Several airports in audience so runway product shown. Noted all potential layers won't all come at once but willing to take feedback on priorities. Some weather layers can be over laid but only if scales/timesteps are compatible.

Focus is on the UK but global info will come later. Live demo completed with some users trying it on their phones. Group asked about OpenRunway, Lauren showed the new display and noted that you will be able to deselect the list of weather items to get just what you want to see.

Group asked "any intention to work with aircraft tracking organisations?" Answer: Airlines have noted this as would be good, group noted use of a non-Met Office app that does this. Noted today was about giving a brief view and noting what people wanted, priorities for future version can be determined on needs of users.

Group asked about F214 and F415 and if we intend to make these look different/data based. Answer: Not as yet, these will look the same for now, as part of NR23 road map some regulated products will move to GIB2 or IWXXM formats to aid machine to machine use.

Questionnaire shared and invite to be part of future testing extended.

Mark updated on some Met Office staff changes in relation to our regulated aviation services

Agenda Item 5: Lunch and tour Operation's Ops centre

The majority of attendees used the opportunity for a short tour of the Met Office Operations centre.

Agenda item 6: Aviation Research and Development (R&D)

Piers noted current R&D highlights:

EPOCH ensemble prediction of convective hazards

Cb forecasts are moving to being probabilistic. Threshold tests used to determine Cb occurrence.

Three thresholds used as noted on the slides.

Verification occurs against satellite detection and lightening detectors globally.

Poor reliability initially so extra data and time steps added, and reliability improved

Example shown for a flight EHXZ80 over Myanmar that experienced severe turbulence. Further development is planned.

SIGWX automation project:

One view of current chart given, it is currently manually created, only for T+24 and at 6 hr intervals.

This is forecaster intensive for the Met Office and of equivalents in the USA. Comparison shown

between old and new. New will be in colour, have more time steps at 3 hr intervals and in be

available in IWXXM. Presenter described the underlying data and how the new charts are produced.

In summary automation will improve timeliness, consistency and number of forecasts available.

Planned to go live in 2025 2025.

UK specific R&D:

Project to understand how / if TAF's can be automated. Produce an algorithm to begin to remove the hand-written element. Trial has proven this has some skill. Machine learning now introduced, to identify which ones need intervention. Trial gives a better use for forecaster time. Tendency to over forecast so looking at how we can correct this. Also working with World Meteorological Office R&D contemporaries to globally understand the science/climate and how advances can be taken into account for existing needs.

Note machine learning does give possibilities, but you still need an on-going understating of what that means to have a good TAF.

Contrail mitigation project: to understand what a reduction might do to mitigate man-made change Supercomputer update given. How does it improve the weather models? In the next 2/3 yrs we will only have an ensemble model (not a deterministic). Our Global model will go out to ten days, maybe eventually 14 days. More frequent analyses. Hope to move to 5km/6km in time.

UK wise: we will formalise our 300m capability in ensemble mode.

R&D globe highlights: Meteo Satellite Generation opportunities, WAFS probabilistic trial and Cb capability.

R&D UK highlights: Machine learning role in fog forecasting, convection nowcasts in real time and improve low level turbulence forecasts.

Question: is verification completed with a mind to the impact of over and under confidence. Answer: we use actual routing info where we can, this requires a lot of data from an airline, but machine learning may help that.

Agenda Item 7: 3-month weather outlook brief

Dan Rudman, Chief Forecaster, presented on the latest 3-month outlook to include the 1 and 3 month headlines for December onwards. We looked at what is normal. We touched on teleconnections that impact the outlook.

Question do you verify these?: Answer: yes, every edition we look back at what actually happened and why so we can look at the reasons and carry that learning forward.

Agenda item 8: Specific issues raised by members

Questions:

Q: Logging into MAVIS, can it talk across devices, so we don't have to log in? And / or can it be done on fingerprint /face recognition? Can the "keep me logged in" button keep you logged in for longer?

A: Not yet, we would like feedback on logging in methodology to drive future updates. Currently we are required to ensure individual users log in.

Q: Any plans for SKEW -T?

A: No. Group discussed what would you use it for? Instead, we will revisit our training plus we will do training for the introduction of MAVIS. Attendee suggested using CAA safety sense leaflets as a good graphical training aid.

Q: Attendee asked Met Office to consider the General Aviation (GA) community as well as commercial users. Acknowledgement that GA output is very much appreciated.

A: Information that GA need will be the foundation of MAVIS with other layers of detail added over this for other users like Search and rescue.

Q: Do you interface with the Air Accident Board (AIB) to understand weather related incidents.

A: CAA will request Met Office to support occasional AIB reports where Met was likely an element and we feed that back into our services e.g. after the Vauxhall helicopter accident, a safety recommendation was that more Met was required over London, Met Office produced London CTA product as a direct result of this AIB result.

Q: Any aspiration to combine with NATS AIS product? E.g. NOTAM's? More conversation needed but as a MET ANSP, it is the Met Office's remit to provide a portal for regulated meteorological Information, just as it is NATS remit to provide airspace information.

Q: We need deterministic answers sometimes, so ensembles do not work for us, or example a max wind speed for balloonists.

A: Point taken but deterministic output over states our ability to forecast. Lots of regulated products will still give a deterministic outcome including balloon products, ensembles may be used behind the

scenes or alongside for those that want it. Journey to use probabilistic forecast information will take a decade plus.

Agenda item 9: Any other business

Attendees encouraged to ensure we have all communities involved in developing MAVIS. Feedback link published.

Agenda Item 10: Date of next meeting

These meetings are held annually, and the Met Office will advertise details of the next one in due course.

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