

International MET updates

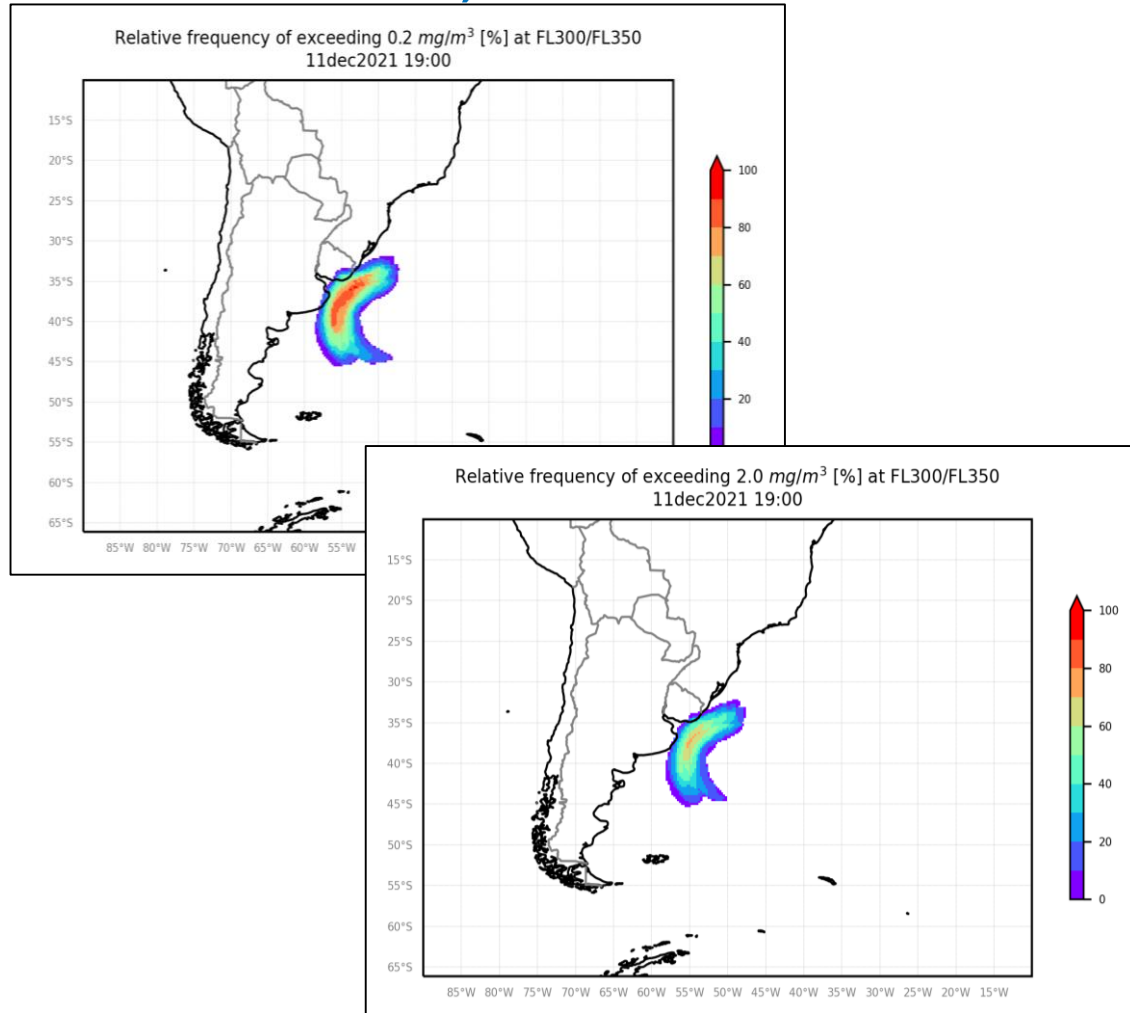


ICAO MET Panel Activities



Amd 81 to Annex 3 – to be applicable November 2024

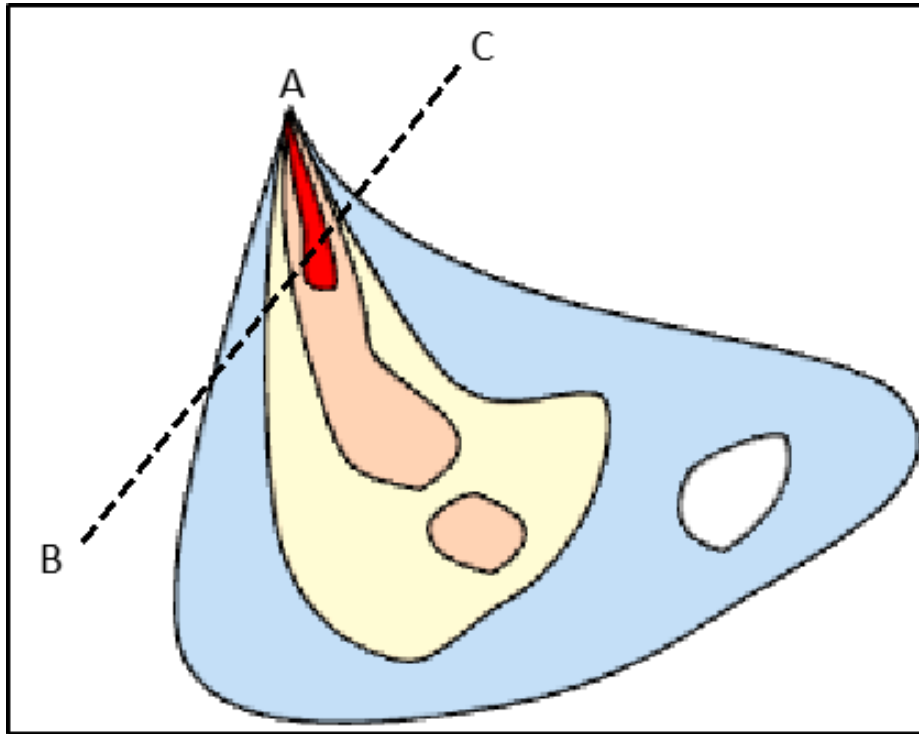
- Contents still under review / to go through State consultation.
- Of interest to NZ aviation:
 - Quantitative volcanic ash (QVA) information service
 - Volcano Observatory Notice to Aviation (VONA) elevation to recommended practice



QVA - gridded

The traditional approach to weather forecasting is known as deterministic, with only one forecast outcome. While this can provide good advice, deterministic forecasting may not provide users with a full understanding of the possible range of outcomes or indicate the risk of encountering specific phenomena.

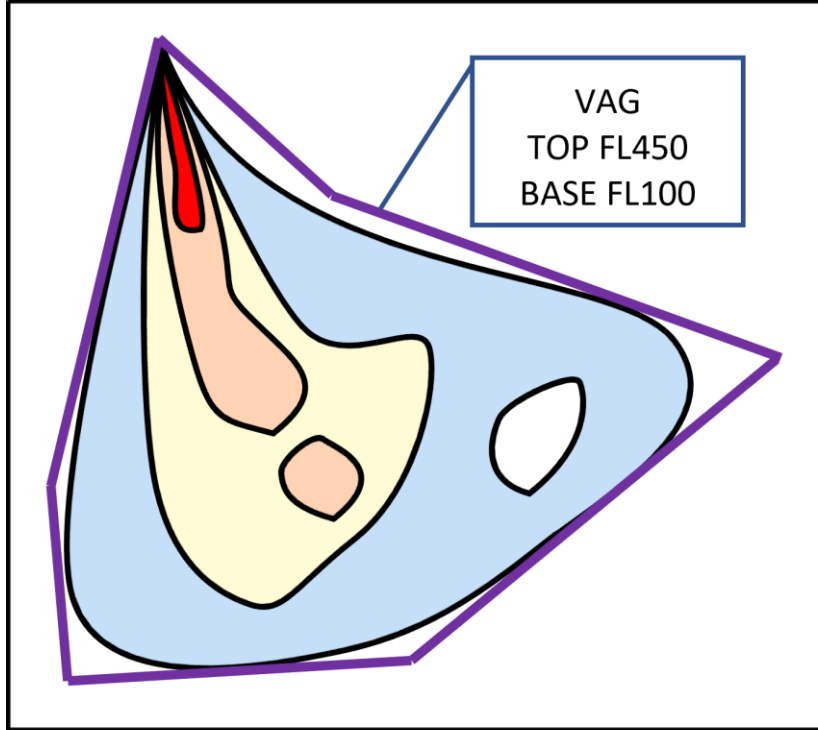
Probabilistic information will be provided by combining information from multiple forecasts – providing intelligence on the most likely evolution of an ash cloud.



QVA - object

QVA information will also be provided in deterministic form – in IWXXM format – describing polygons of different ash concentrations.

QVA information offers operators the opportunity to move away from traditional discernible/visible ash criteria and instead use certified engine susceptibility for flight route planning and inflight re-planning.



QVA - object

QVA information can also be displayed in “VAA” or “SIGMET” format, if preferred.

The lowest concentration in the QVA information set is roughly equivalent to “discernible ash” – what a VAAC forecaster will use to plot their VAA.

QVA information is anticipated to eventually replace traditional forecaster created VAA/VA SIGMET.



METEOROLOGY PANEL



Quantitative Volcanic Ash (QVA) Concentration Information

First edition – 13 September 2022

1 Introduction

This document describes the quantitative volcanic ash (QVA) concentration information (hereafter referred to as 'QVA information') that is planned to be provided by volcanic ash advisory centres (VAAC) as part of the International Civil Aviation Organization's (ICAO) International Airways Volcano Watch (IAVW). It is the first in a series of information "flyers" on QVA information.

Over the past two decades there were many requests by representatives of the IAVW, through various ICAO and World Meteorological Organization fora, for aircraft and engine manufacturers to provide information on the susceptibility of aircraft and their engines to volcanic ash. The specific desire was for ash concentration thresholds to be identified that did not pose a safety concern but could improve route efficiency. This need has led to the development of QVA information.

QVA information offers operators the opportunity to move away from traditional discernible/visible ash criteria and instead use certified engine susceptibility for flight route planning and inflight replanning. Visible ash is what an observer or flight crew member sees with their eyes. The lower limit of visible ash ranges from approximately 0.01 mg/m³ to 10 mg/m³, depending on many factors such as time of day, sky background, position of the sun to the observer (pilot) as well as the angle the ash cloud is viewed (e.g., viewed from the side). Discernible ash is what a satellite or other remote sensing instrument detects. Discernible ash from satellites has been used by the VAACs to define the observed area in the volcanic ash advisories (VAA) in both text and graphic form (VAG) over the past two decades. The lower limit of discernible ash from satellites is approximately 0.1 mg/m³ to 0.2 mg/m³, depending on the satellite and other factors.

QVA information will begin with an initial operating capability (IOC) that is planned to be implemented in three phases in the mid-2020s.

2 Initial operating capability (IOC)

The IOC for QVA will provide forecasts of ash concentration in two data formats for significant eruptions.

2.1 Format

QVA information will be provided in two file formats. Objects will be provided in ICAO's Meteorological Information Exchange Model (IWXXM) format. Gridded data will be provided in a file format which has yet to be determined but will probably be a binary format. The IWXXM format contains a subset of the entire gridded data file set.

QVA Flyer

More information about the new service can be found the CAA website:

<https://www.aviation.govt.nz/airspace-and-aerodromes/meteorology/met-developments/volcanic-hazards/>

VONA elevation



- Currently a “suggested” format – will become a recommended practice – volcano observatories *should* provide volcanic activity information in VONA format
- Will mean that VONA will form part of a pre-flight briefing material and be distributed in a similar manner to MET warning products
- Allows for a review of how volcanic hazards are managed in our air space.

Aviation colour code vs VAL



Aviation colour code (in VONA) is *specifically* referring to hazards for aviation, while VAL refers to both ground-based and atmospheric hazards for everyone.

An eruption in the style of Kilauea in Auckland could result in a VAL of 4, but not necessarily be a hazard to aviation – the resulting VHZ could be unnecessarily restrictive.



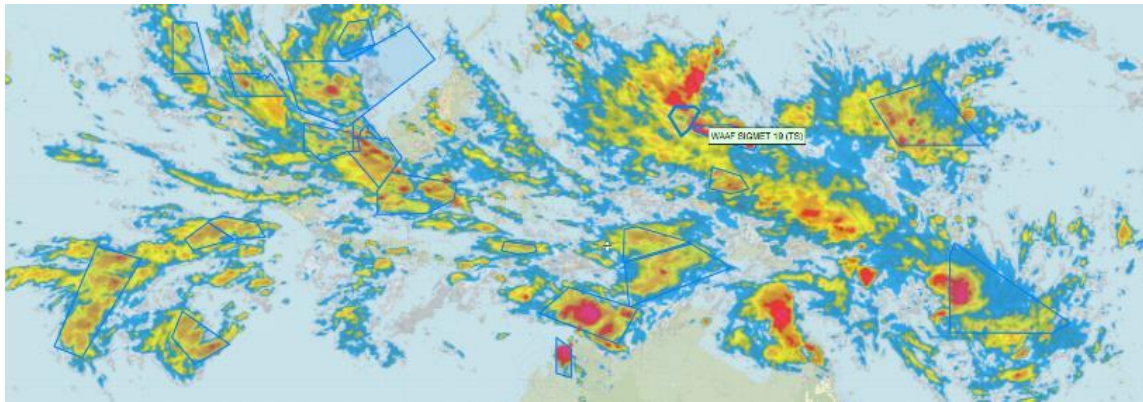
Kilauea lava flow is seen on a road in Pahoehoe, 2018. KRIS BURMEISTER/via REUTERS

ICAO MET Panel Activities



Amd 82 to Annex 3 – expected applicability November 2026

- Aiming for Hazardous Weather Information Service (HWIS) introduction



SIGMET issues...

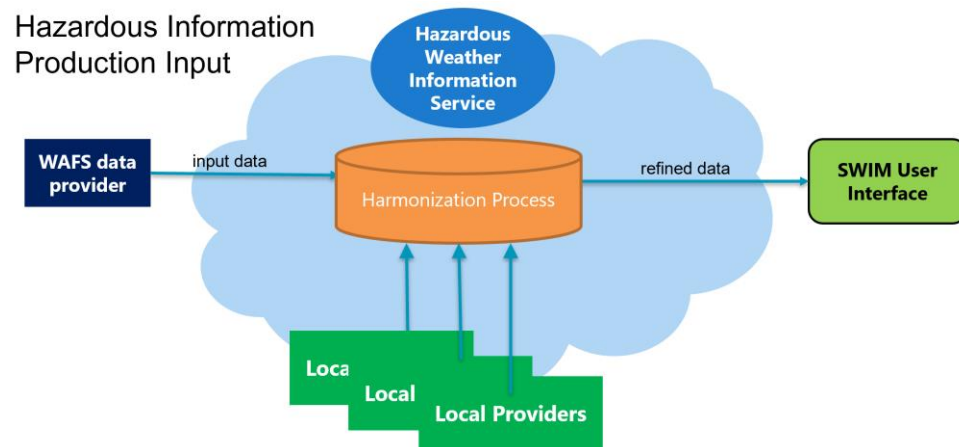
- Conflicting or missing information
- Lack of precision – temporal/spatial
- FIR boundary discontinuities
- Excessive latency, ad hoc production
- Etc....

ICAO MET Panel job card:

“...need for phenomena-based, globally-consistent hazardous weather information service system for select en-route hazardous meteorological conditions...”



HWIS – 7 principles



1. Phenomena-based, globally consistent.
2. SWIM-compliant provision of harmonized obs and forecasts.
3. Reflect best available intelligence on current and predicted state of known MET hazards.
4. Users obtain bespoke HWIS guidance to inform decision support products.
5. Automated, quality-assured, harmonized – with appropriate human input and controls.
6. Won't use “advisory” or “warning” descriptions – but these may be outputs of the HWIS information.
7. Current operational challenges to global SIGMET service will be addressed separately to HWIS development.

WMO Activities



- SC-AVI matters
- SERCOM-2 outcomes
- Rotorua meetings Feb 2023

Standing Committee on Services for Aviation (SC-AVI)



- WMO/UKMO/BOM/MetService Aero Met Online Seminars, 8-10 Nov 2022
 - Topics: fog/low ceiling; volcanic ash; icing
 - Asia/Pacific and Europe/Africa
- Global Survey on Gender Equality in Aeronautical Meteorology Report – Q4 2022
- Climate change considerations (ET-CCV)
- WMO ‘White Paper’ on SEB hydromet services (incl aero products & services)
- Membership of SC-AVI
- <https://community.wmo.int/activity-areas/aviation/governance/sc-avi>



Pictured left to right, top to bottom: Pat Murphy, Andrea Henderson, Ian Lisk, Oluwaseun Wilfred Idowu, Rodrigo Fajardo Rossel, Kathy-Ann Caesar, Stéphanie Wigniolle, James Lunny, Adriana Oskarsson, Claudia Ribero, Gaborekwe Khambule, Kaspar Bucher-Studer, Yong Wang, Jun Ryuzaki, Lei Gu, Kent Johnson, Greg Brock, Matt Strahan, Sharon Lau and Ping Cheung. (Not pictured: Marina Petrova)

Second Session of WMO Services Commission (SERCOM-2)



- SERCOM-2, 17-21 Oct 2022, Geneva and online
 - Meeting outcomes found at: <https://meetings.wmo.int/SERCOM-2/English/Forms/AllItems.aspx>
 - **Doc. 5.1(3)** on the proposed amendment to WMO-No. 49, Volume I and update to WMO-No. 1209 addressing aeronautical meteorological personnel qualification and competency requirements >> APPROVED
 - **Doc. 5.1(6)** on the plan of action for the discontinuation of WMO-No. 49, Volume II >> APPROVED
 - **Doc. 5.4** on the update to WMO-No. 732 on service delivery and WMO-No. 904 on cost recovery >> APPROVED
 - **INF. 5.4** on the status of the update to the long-term plan for aeronautical meteorology >> NOTED
 - **Doc. 7.2** on amendments to the terms of reference of the standing committees and study groups of SERCOM >> APPROVED
- Approved resolutions will be taken to the World Meteorological Congress, May/June 2023 for endorsement

Volcanic Ash meetings, Rotorua, Jan-Feb 2023



- IUGG International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) Scientific Assembly, [30 Jan – 3 Feb](#)
 - IAVCEI SA website [here](#)
- **WMO Eighth International Workshop on Volcanic Ash (IWVA-8), [4-5 Feb](#) (1.5 days)**
 - **Strong aviation industry focus (airline operators, airframe and engine manufacturers)**
 - **Strong focus on existing capabilities and capability gaps amongst volcano observatories**
 - IWVA-8 website [here](#)
 - **Abstract submission 16 Nov 2022 (today)**
 - **Registration by 13 January 2023**
- WMO Advisory Group on Volcanic Science for Applications (AG-VSA-1), [7-9 Feb](#)
- ICAO 20th Meeting of the MET Panel (METP) Working Group – MET Operations Group International Airways Volcano Watch Work Stream (WG-MOG/20 IAVW), [7-9 Feb](#)