International Civil Aviation Organization

INFORMATION PAPER (IP/28)

ICAO Asia and Pacific (APAC)
Twenty-Ninth Meeting of the Meteorology Sub-Group (MET SG/29)

Bangkok, Thailand, 18 to 22 August 2025

Agenda Item 6: Research, development and other initiatives

World Area Forecast System (WAFS) update

(Submitted by WAFC London)

SUMMARY

This information paper provides information on the World Area Forecast Service (WAFS) new SADIS and WIFS API services, new higher resolution World Area Forecast System (WAFS) gridded data sets, and WAFS Significant Weather (SIGWX) forecasts.

1. INTRODUCTION

1.1 Over the past few years the World Area Forecast Centres have been working hard at developing and then introducing upgrades to the WAFS data sets. This paper gives a brief overview of the changes and information on how the new data can be accessed.

2. DISCUSSION

WAFS DATA SETS

2.1 In March/April 2024 higher resolution gridded data sets were introduced with more timesteps, and vertical levels available than previously, along with an increase in the horizontal resolution for the wind and temperature data sets. Appendix A shows what data sets are now available.

2.2 On 23 January 2025 the legacy T+24 SIGWX forecast charts and BUFR data was fully automated. The WAFS gridded data is used to create jet streams and cumulonimbus, turbulence and icing polygons, and volcanic ash advisories and tropical cyclone advisories are processed to indicate where these phenomena are occurring. The changes to the content of the SIGWX was described in detail at the MET SG-28 meeting in 2024. Included in the development work was the introduction of fully automated fallback procedures.

2.3 On 8 April 2025 work on the new multi-timestep SIGWX was completed. This new SIGWX spans FL100 to FL600 and contains forecasts for T+6 to T+48 at 3-hourly intervals in a new IWXXM format.

2.4 All of the new data sets, and content changes for SIGWX were agreed though the ICAO Met Panel and the ICAO Air Navigation Commission, and will appear in Amendment 82 to ICAO Annex 3 and the accompanying first edition Doc 10157 (PANS-MET) in November 2025.

SADIS API AND WIFS API

2.5 Access to the new higher resolution WAFS data sets is via the SADIS API (operated by WAFC London) and the WIFS API (operated by WAFC Washington). Both WAFC's have worked closely together to ensure that the systems are harmonized where possible, and both systems are SWIM compliant and use the Open Geospatial Consortium Environmental Data Retrieval (OGC-EDR) API framework https://ogcapi.ogc.org/edr/. Due to local constraints however, different user authentication is required for each system.

2.6 There are three parts to data available on the SADIS API and WIFS API:

- WAFS Gridded data
- WAFS OPMET data
- WAFS SIGWX data

2.7 As well as global data, regional tiles are available, as shown in figure 1. Please use these tiles if they meet your needs.

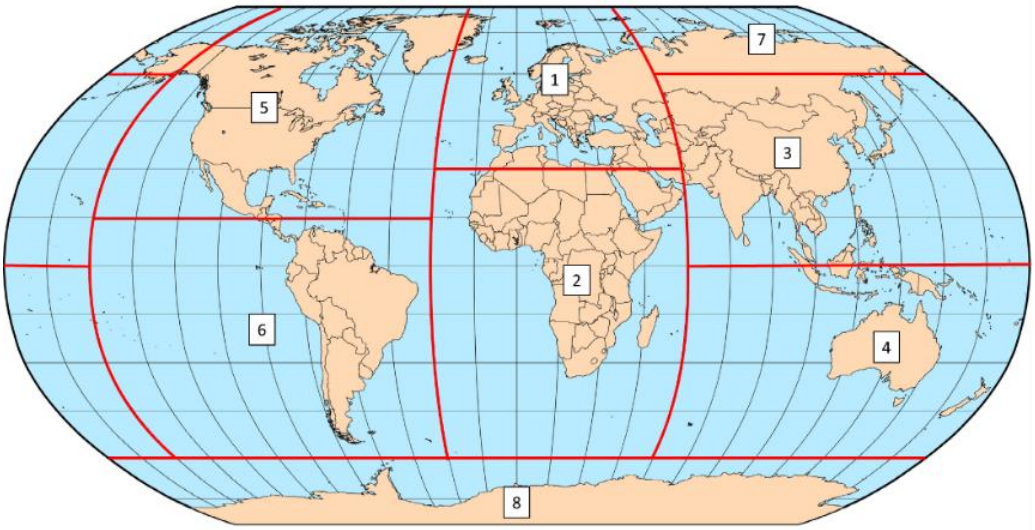

Figure 1 – Regions/Tiles of data that will be made available on the SADIS and WIFS APIs

2.8 Access to the SADIS and WIFS API's is granted for existing SADIS FTP and WIFS users as well as other aviation industry users (your primary service remains the same as it is now – e.g. if you use WIFS then as your primary service you should use the WIFS API). Registration information is available here:

- https://www.metoffice.gov.uk/services/transport/aviation/regulated/international-aviation/sadis/sadis-api/index
- https://aviationweather.gov/wifs/api.html

2.9 **IMPORTANT: The existing SADIS FTP and WIFS systems are planned for retirement in November 2028, so you need to start planning to migrate over to use the newer APIs. The sooner you do this the sooner you can also benefit from the higher resolution WAFS forecasts that are available.**

WHAT IS COMING NEXT?

2.10 The WAFCs are already planning for the next set of upgrades to the WAFS gridded data sets which will be probabilistic forecasts and turbulence type. In November 2028 the WAFCs, subject to ICAO ANC approval will introduce the data shown in table 1 to the SADIS API and WIFS API:

Phenomena	Flight levels
Probability of turbulence EDR ≥ 0.45	FL 240, FL 270, FL 300, FL 340, FL 390, FL 450
Probability of turbulence EDR ≥ 0.20	
Probability of moderate or severe icing	FL 050, FL 100, FL 140, FL 180, FL 240
Probability of tops of cumulonimbus clouds exceeding FL300	—
Probability of tops of cumulonimbus clouds exceeding FL350	
Probability of tops of cumulonimbus clouds exceeding FL400	

Table 1 – probabilistic WAFS forecasts planned for introduction November 2028.

2.11 At the same time, individual turbulence type forecasts will be introduced, with separate data sets that will indicate the turbulence due to clear air turbulence (CAT) and the orographic (or mountain wave) turbulence separately.

2.12 All the new forecasts will be provided for T+6 to T+48 at 3-hourly intervals, at a 0.5 degree horizontal resolution.

2.13 These new probabilistic hazard and turbulence type forecasts are the initial offering, and after implementation a review will be carried out with users to see how to build on this offering. For example is there value in providing the probability of turbulence exceeding other EDR thresholds.

CONCLUSION

2.14 The WAFCs have now implemented a major upgrade to the provision of WAFS gridded data sets, and users are encouraged to start getting their systems set up to use this new data and the new APIs so they can benefit from the higher resolution data. Guidance material is supplied by the WAFCs once registration is complete.

3. ACTIONS BY THE MEETING

3.1 The meeting is invited to:

a) Note the information in this paper

b) Talk to their technical team or software provider about migrating over to use the new SADIS API and WIFS API.

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APPENDIX A – new WAFS gridded data sets

0.25-degree horizontal resolution WAFS gridded data	**1.25-degree horizontal resolution WAFS gridded data**
Parameters • Wind U/V – 56 vertical levels from FL050 to FL600 • Temperature – 56 vertical levels from FL050 to FL600 • Geospatial Height – 56 vertical levels from FL050 to FL600 • Relative Humidity – 14 vertical levels from FL050 to FL180 • Tropopause height and Tropopause temperature • Max wind height, and max wind u/v • Icing Severity – 26 vertical levels from FL050 to FL300 • Turbulence Severity – 36 vertical levels from FL100 to FL450 • Cumulonimbus Extent, Base and Top WAFC London and WAFC Washington data is available.	**Parameters** • Wind U/V – 17 vertical levels from FL050 to FL530 • Temperature – 17 vertical levels from FL050 to FL530 • Geopotential Height – 17 vertical levels from FL050 to FL530 • Relative Humidity – 5 vertical levels from FL050 to FL180 • Tropopause height and Tropopause temperature • Max wind height, and max wind u/v WAFC London and WAFC Washington data is available.
Forecast Timesteps: • T+06 to T+24 at 1-hourly intervals • T+27 to T+48 at 3-hourly intervals[1] • T+54 to T+120 at 6-hourly intervals[2] *Note:* *[1]Icing, Turbulence and Cumulonimbus data will stop at T+48* *[2]WAFC London data past T+66 will only be produced for the 00Z and 12Z model runs* Data is available as global and regional tiles	**Forecast Timesteps:** • T+06 to T+36 at 3-hourly intervals Data is available as global tiles only.

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