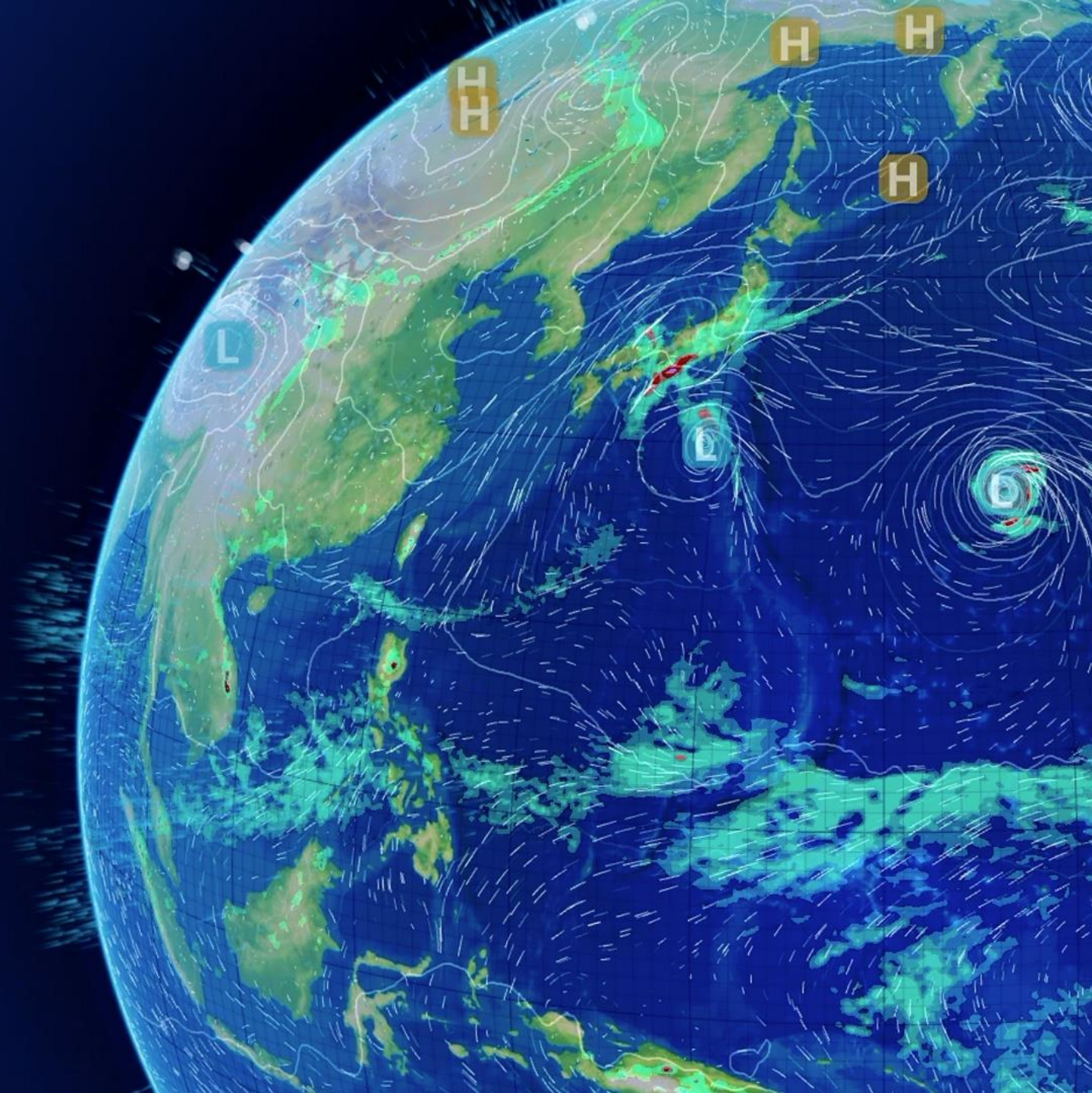


# World Area Forecast System (WAFS) SIGWX upgrade

November 2024



## WAFS CHANGES COMING IN WITH AMENDMENT 82 TO ANNEX 3 ....

Multi-timestep WAFS Significant Weather (SIGWX) forecasts will be introduced into ICAO Annex 3 with Amendment 82 (expected November 2025).

**Important: WAFC London and WAFC Washington will be introducing the new SIGWX forecasts 1 year early on 26 November 2024.**

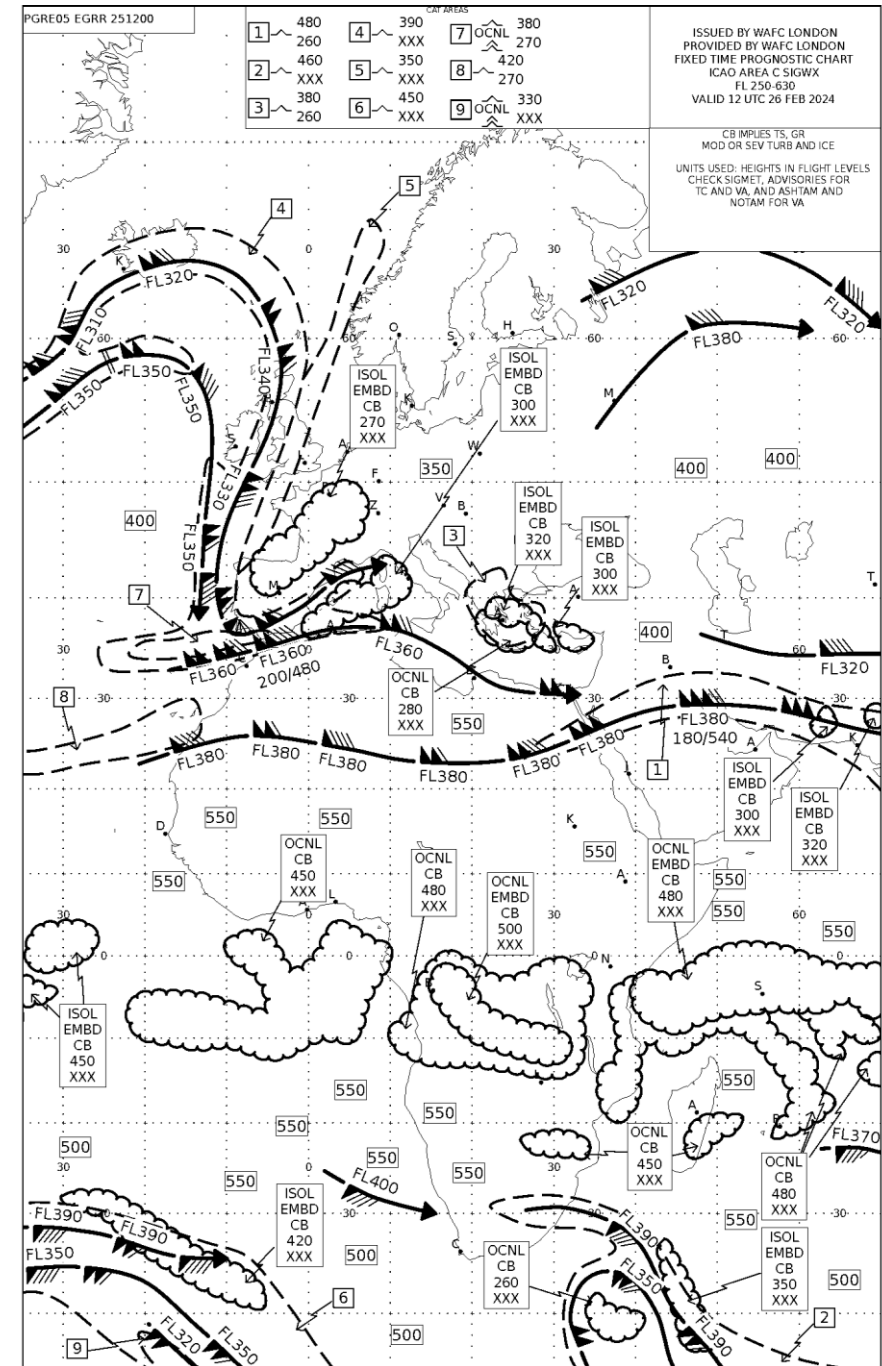
**This will introduce some changes to the current T+24 SIGWX forecasts.**

## NEW WAFS SIGWX FORECASTS

Current SIGWX forecast are produced for T+24 only, with new charts/data issued every 6 hours.

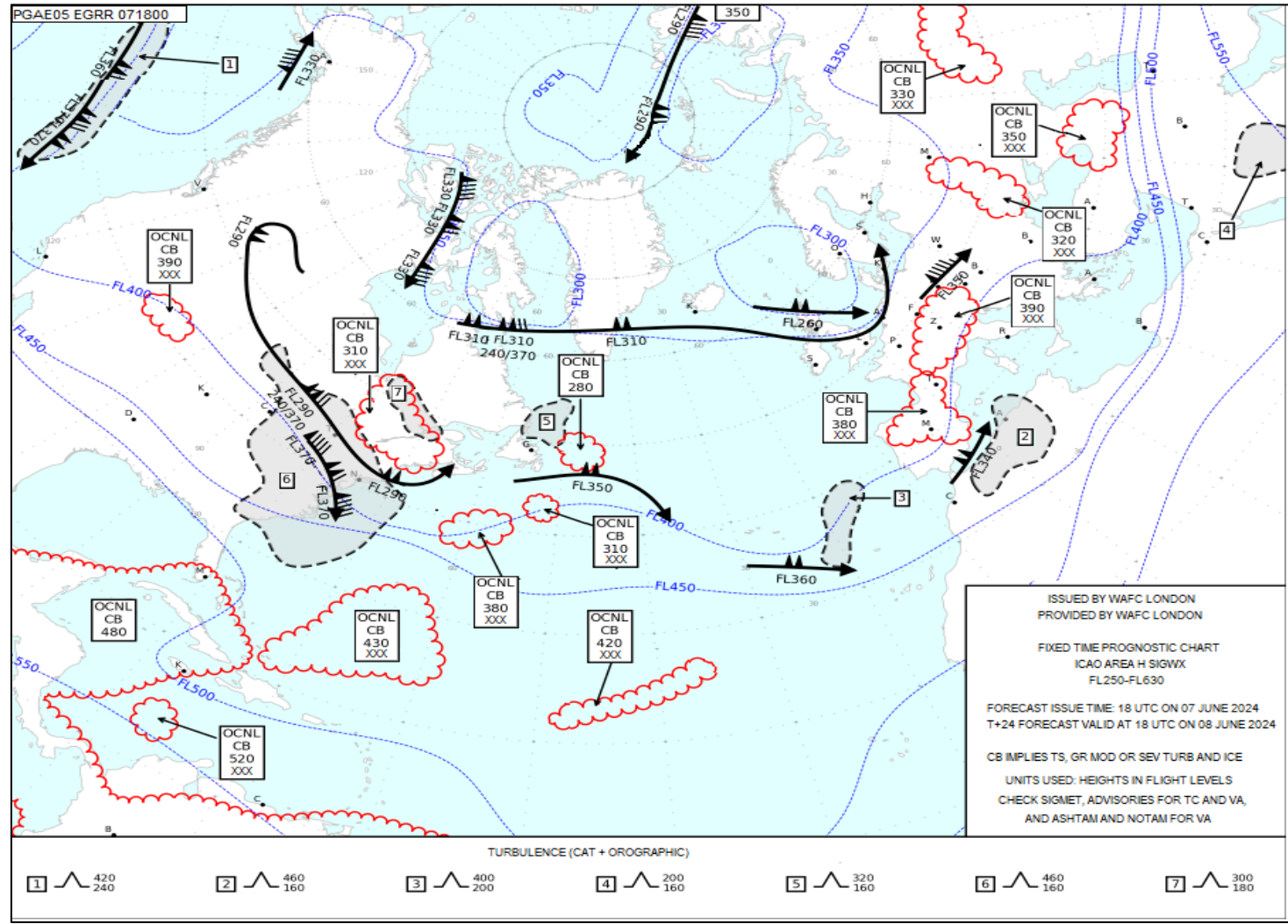
They are hand drawn by a team of meteorologists

The last time they changed was in 2008 when surface fronts were removed.



# NEW WAFS SIGWX FORECASTS

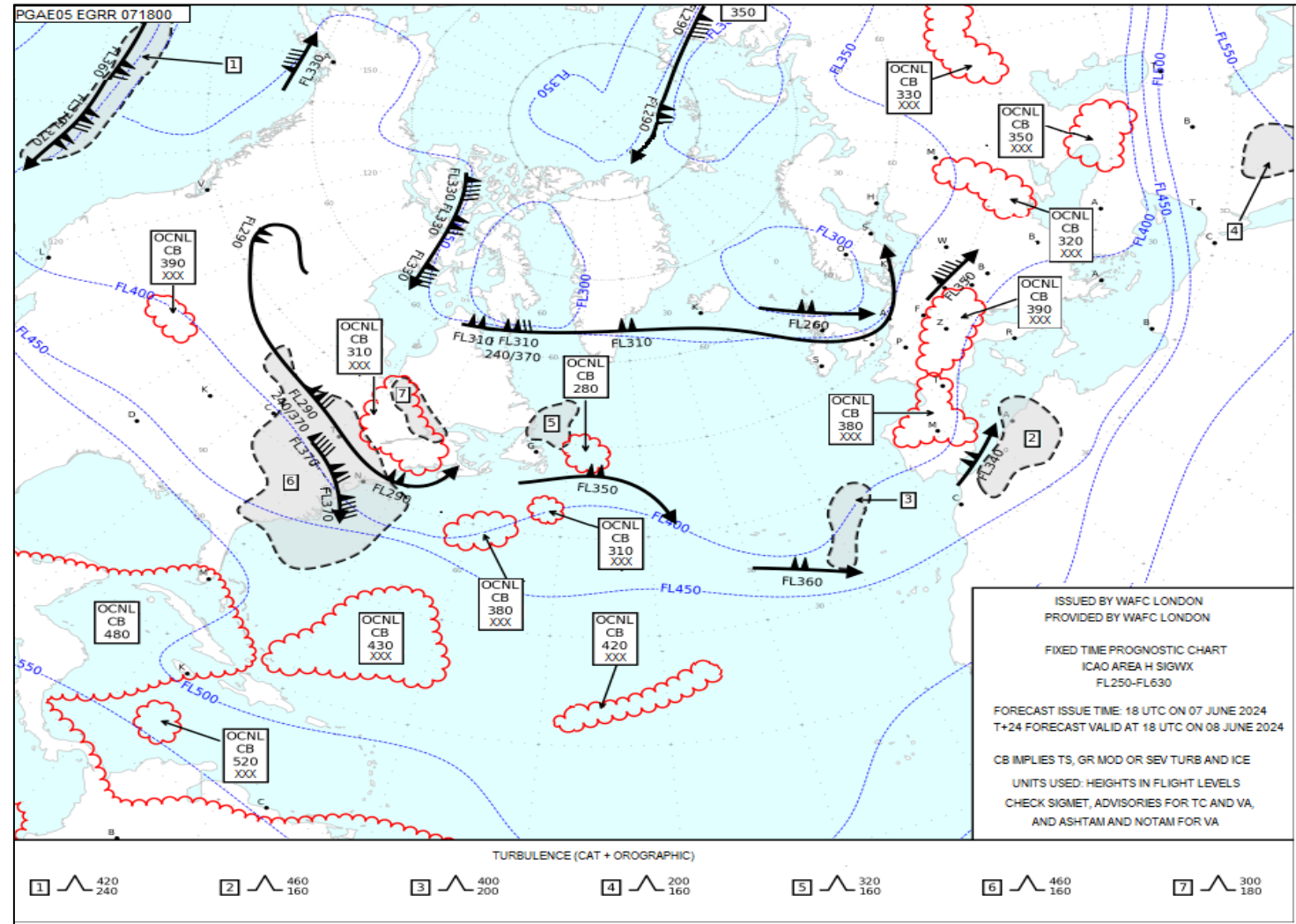
- New automated SIGWX provision will be for T+6 to T+48 at 3-hourly intervals, with new data published every 6 hours.
- The new SIGWX will span FL100 to FL600



# NEW WAFS SIGWX FORECASTS

The new SIGWX forecasts will contain:

- Jet stream information
- Tropopause height as contours
- Areas of OCNL or FRQ CB (no embedded CB's)
- Areas of MOD and SEV turbulence areas will be forecast based on the grided WAFS Turbulence Severity field (which is CAT + orographic turbulence types)

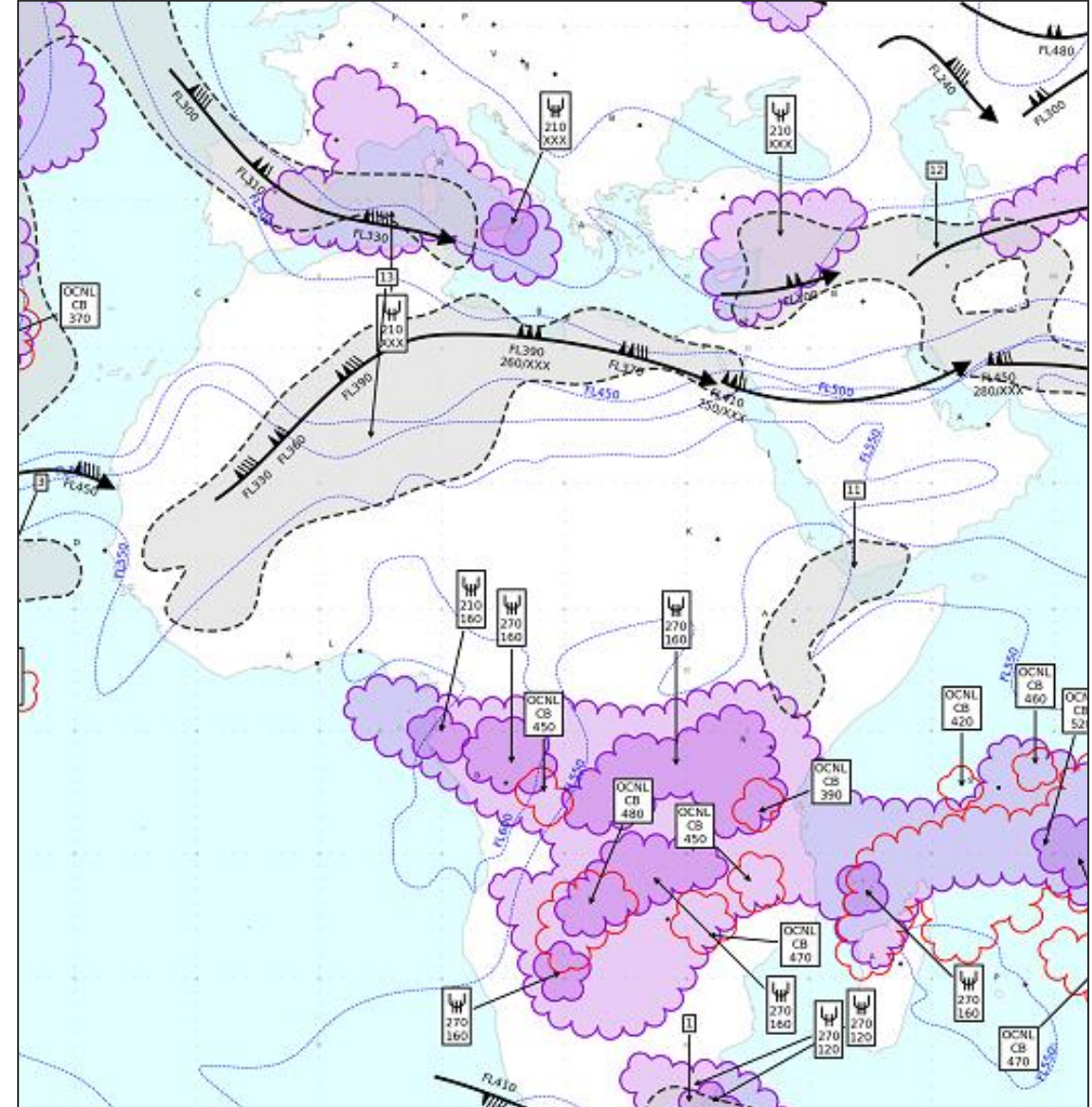


## NEW WAFS SIGWX FORECASTS

The new SIGWX forecasts will contain:

- Areas of MOD and SEV icing (with global coverage)
- Information on active volcanic eruptions, tropical cyclone positions and radioactive releases.

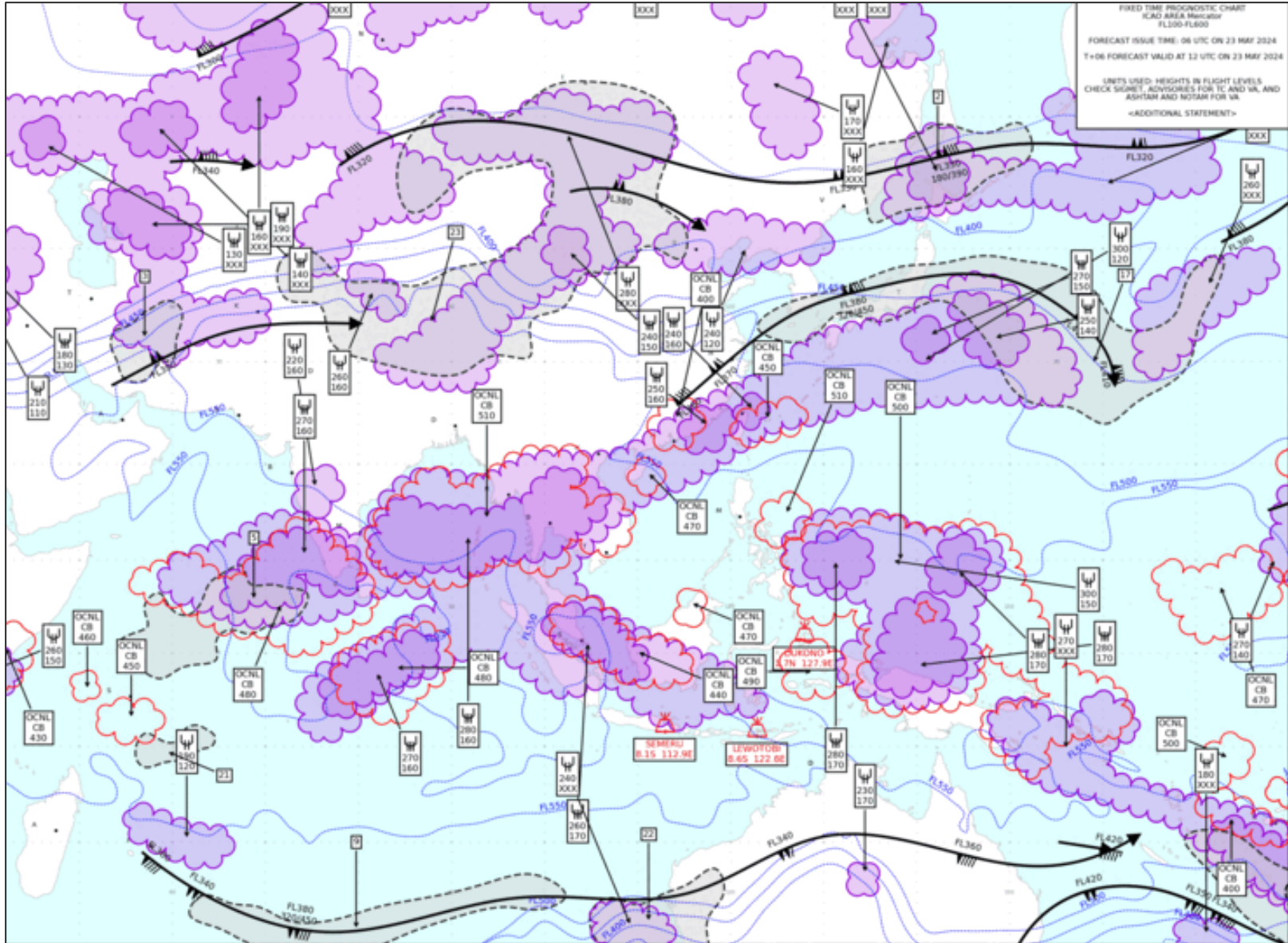
*Note: tropical cyclone markers will only be shown up to and including T+24.*



## WHY CHANGE THE SIGWX?

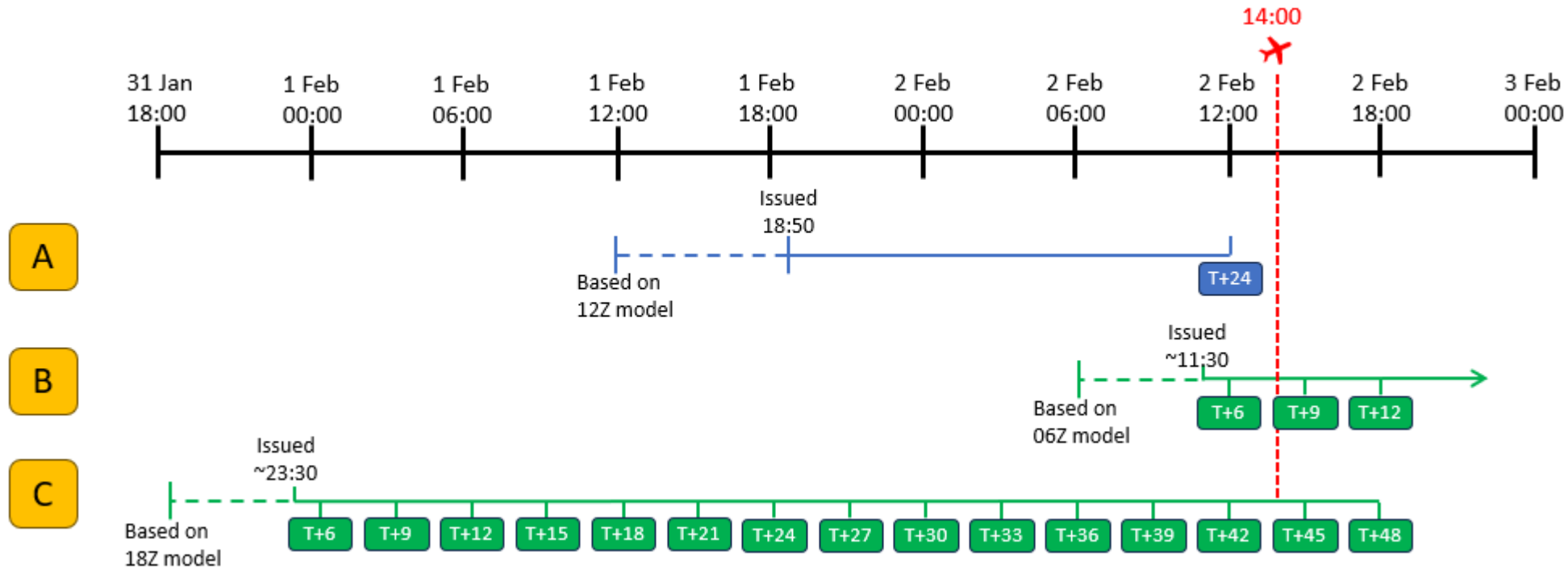
Benefits of the new SIGWX forecasts:

- Need forecasts which are better suited to the needs of the aviation industry particularly for short haul and long-haul flights.
- The gridded WAFS data and SIGWX data sets will be consistent with each other
- Designed for digital use, where users will be able to control the content that is shown on their screen (e.g. toggling layers on and off, changing time-steps)
- Movement and evolution of features with time can be seen





SIGWX forecasts for a particular validity time will be available with a longer lead time and using more up to date model data.



## NEW WAFS SIGWX FORECASTS

The new SIGWX data will be provided in IWXXM format. The schema has been developed and approved by WMO

<https://schemas.wmo.int/iwxxm/2023-1/WAFSSigWxFC.xsd>

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    <iwxxm:phenomenaList xlink:href="http://codes.wmo.int/49-2/MeteorologicalFeature/CLOUD"/>
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```

## NEW WAFS SIGWX FORECASTS

The new SIGWX data will only be available via the SADIS API and WIFS API.

Information on the APIs, including how to sign up:

SADIS:

<https://www.metoffice.gov.uk/services/transport/aviation/regulated/sadis/info/sadis-api>

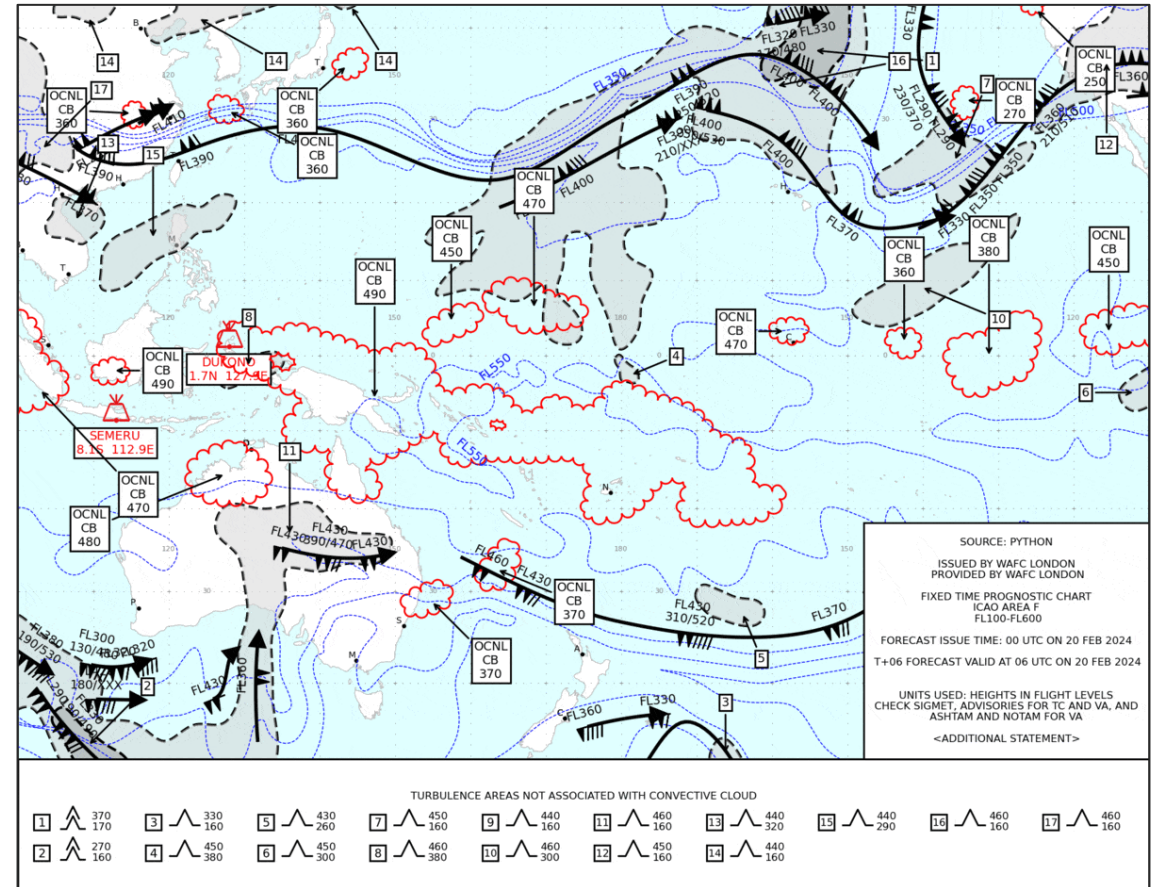
WIFS:

<https://aviationweather.gov/wifs/>

*Note: Briefing quality charts will not be provided for the new SIGWX, but charts that can be used for cross-checking/setup of systems will be available on the API's.*

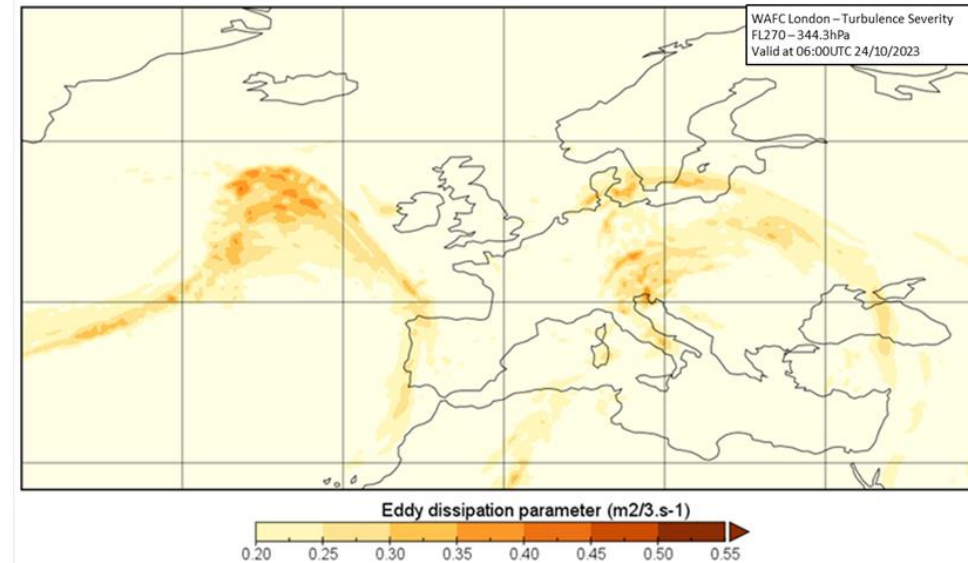
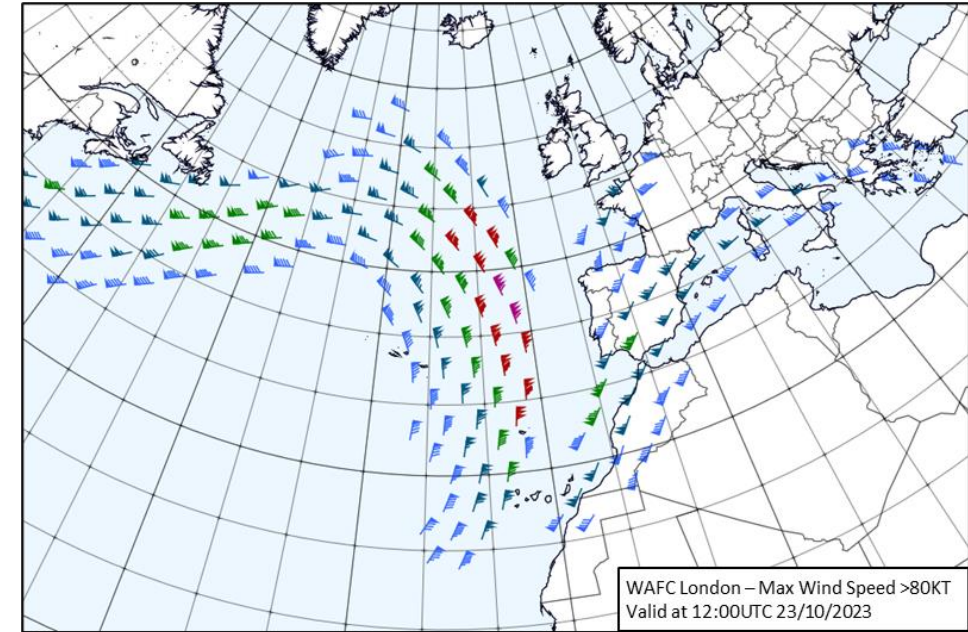
# NEW WAFS SIGWX FORECASTS

- If briefing charts are required, the user's system/software should create these.
- Benefits of this approach:
  - User specific colour schemes, map areas, and map projections can be applied
  - Other features can be overlaid on the SIGWX (e.g. flight paths, wind fields, or other non-WAFS weather parameters).



## WHAT ELSE IS AVAILABLE ON THE NEW SADIS AND WIFS APIs?

- The new WAFS gridded data sets with a higher resolution, more vertical levels and more timesteps (including hourly intervals from T+6 to T+24 and at 6-hourly intervals out to T+120)
- “OPMET data” – e.g. TAF, METAR, SIGMET, Volcanic Ash Advisories, Tropical Cyclone Advisories, Space Weather Advisories in traditional alphanumeric format and where available IWXXM format.



## IMPORTANT

On 26 November 2024 there will be changes to the existing T+24 forecast charts and BUFR data.

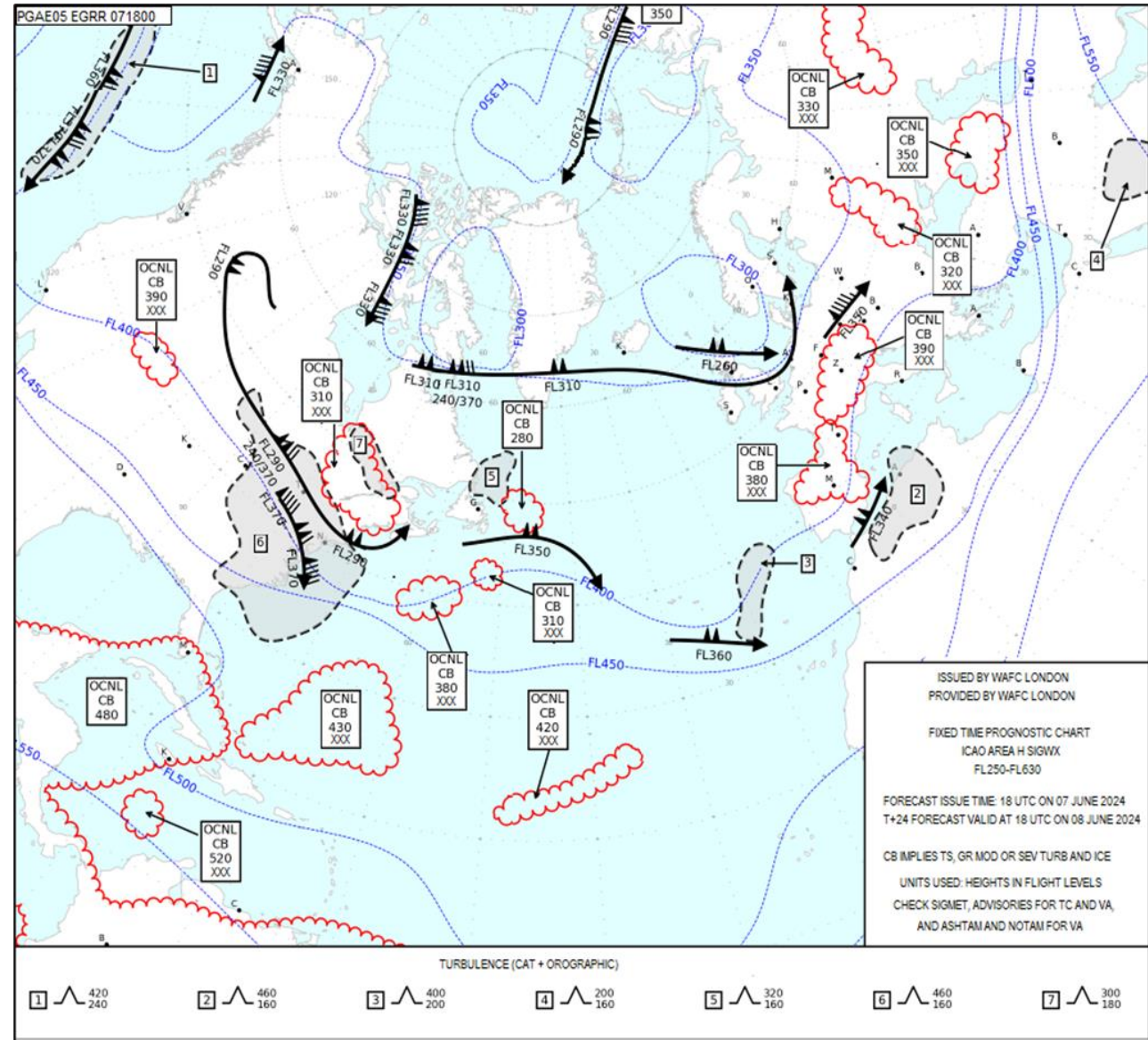
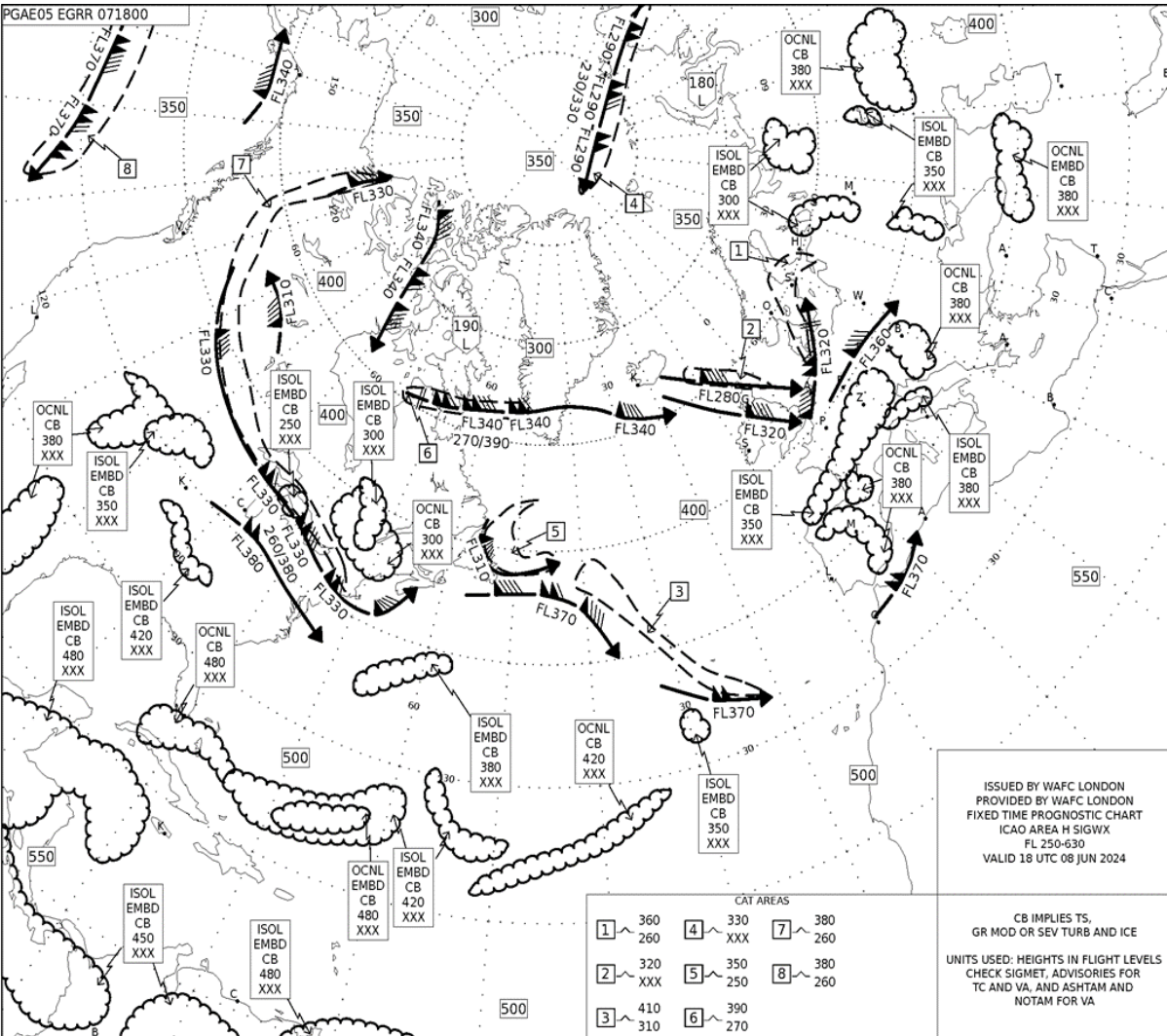
Please make your stakeholders and operators are aware of the upcoming changes.

## WHAT WILL CHANGE IN THE OLD T+24 SIGWX CHARTS?

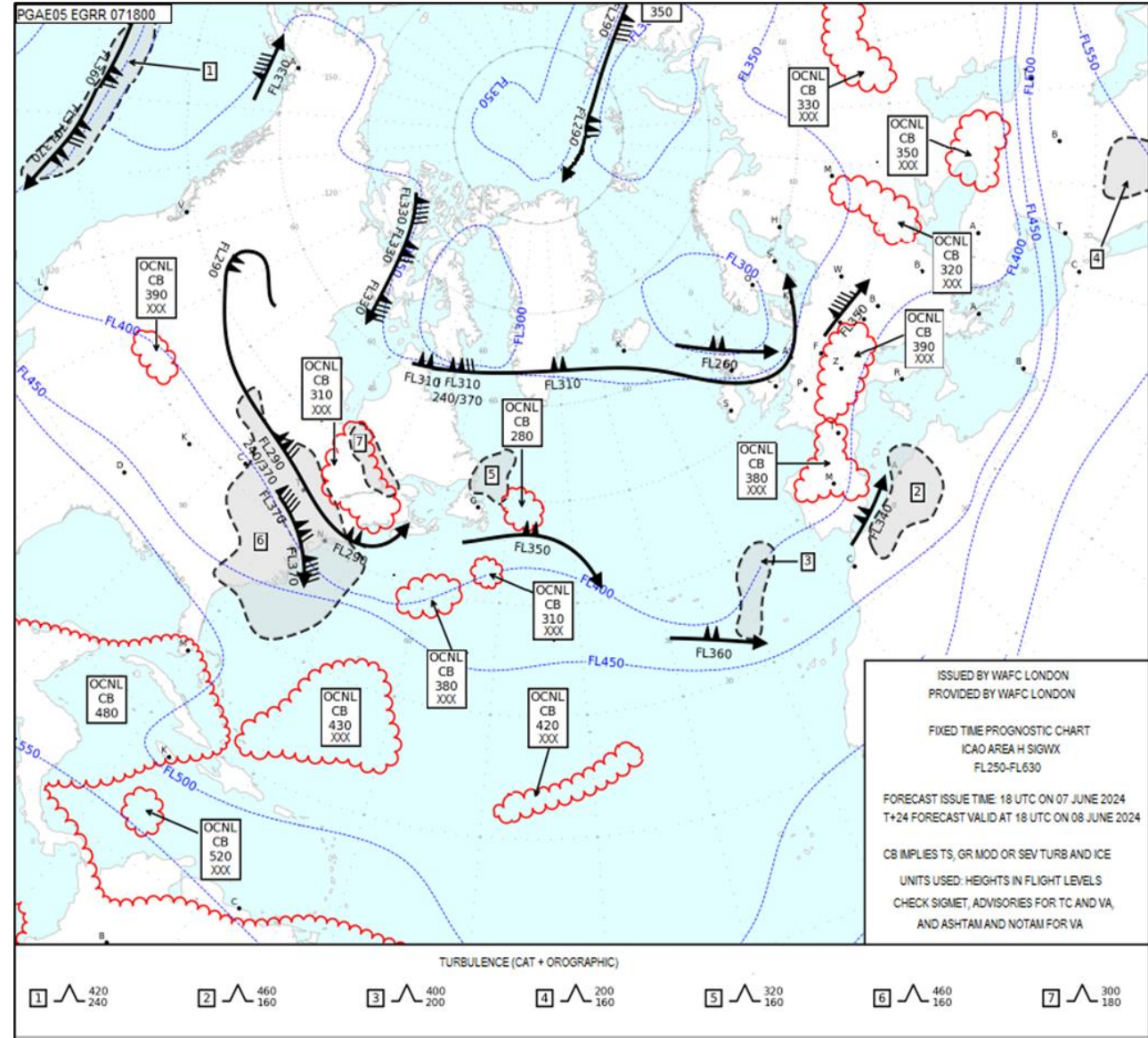
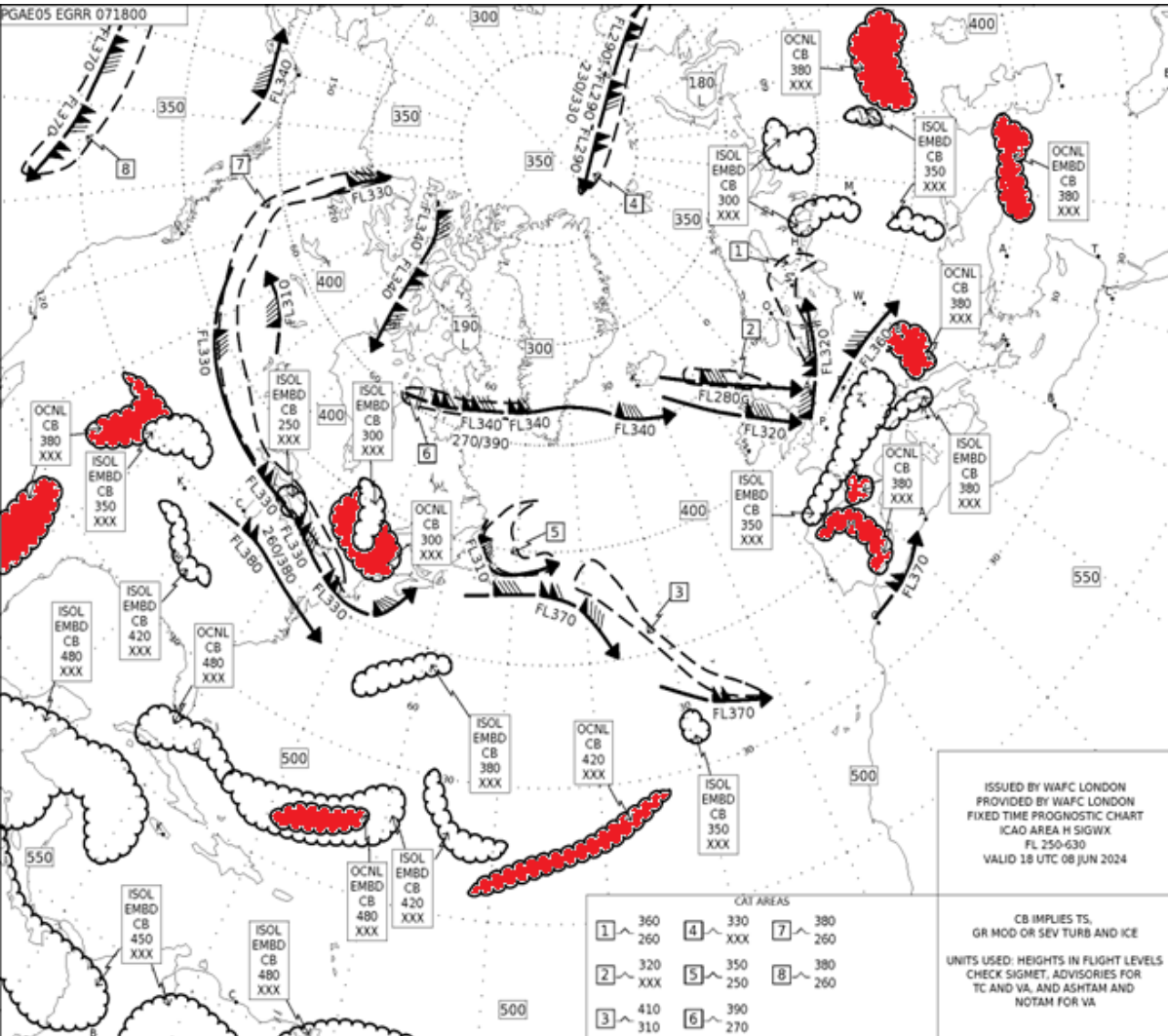
Medium and High level T+24 “Paper copy” (.png) charts will still be provided via SADIS FTP and WIFS until 2028. There will be some change in their content and appearance:

- They will be provided in colour!
- Embedded cumulonimbus cloud will not be included. This means that ISOL EMBD CB, OCNL EMBD CB and FRQ EMBD will not be shown. Instead only OCNL CB and FRQ CB will be forecast.

There will be more areas of OCNL CB forecast than they are now.

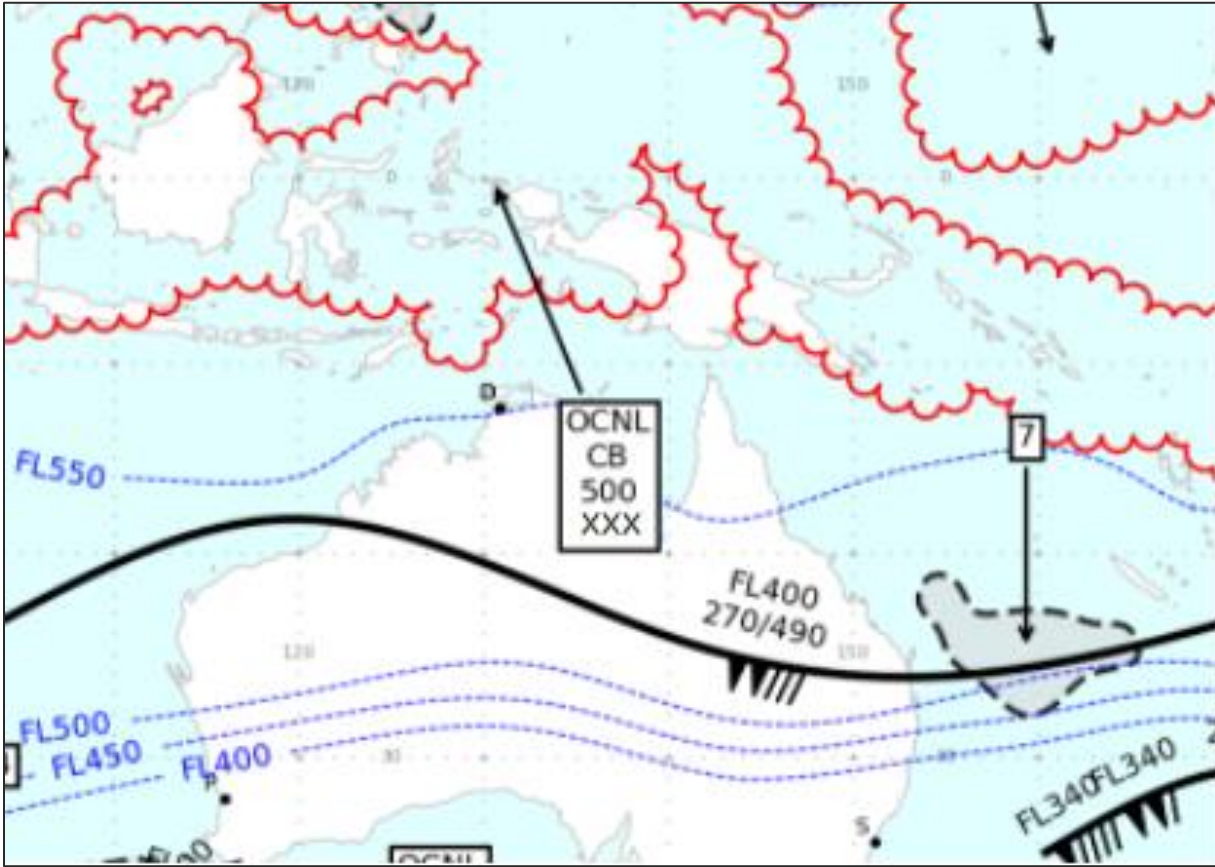




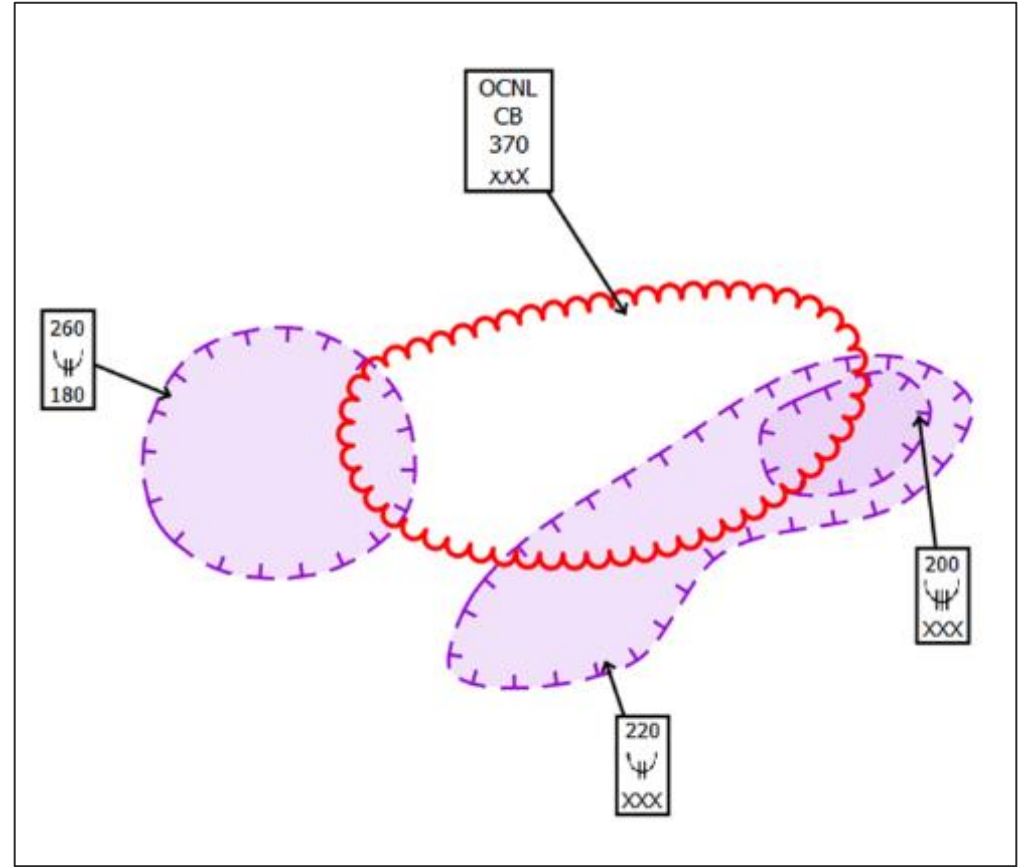


## WHAT WILL CHANGE IN THE OLD T+24 SIGWX CHARTS?

- Clear Air Turbulence (CAT) areas will become “turbulence”. MOD and SEV turbulence areas include turbulence due to CAT and orographic turbulence types and if it is strong enough turbulence within non-convective clouds.
- Tropopause height will be shown as contours spaced at 5000ft vertical intervals. Labels will be in the form FL300, FL350 etc.
- On the medium level SIGWX the in-cloud turbulence and icing areas will become icing only areas.



Blue tropopause contours



Purple icing areas with a new line style to make easier to identify.

## WHAT WILL CHANGE IN THE OLD T+24 SIGWX CHARTS?

- The high level SIGWX will change to span FL250 to FL600 (changing from FL250 to FL630).
- They will be produced earlier than they are now (by approx. 1 hr)
- T+24 BUFR data files will continue to be provided via SADIS FTP and WIFS until November 2026. They will reflect most of the changes that have been described for the T+24 SIGWX charts, except:
  - tropopause will still be in the form of spot heights.
  - Icing objects will not go through cumulonimbus areas.

## VERIFICATION

- The SIGWX forecasts are based on the WAFS gridded data sets
- Verification has been carried out to ensure the T+24 SIGWX is at least as good as the current hand drawn one. The new SIGWX forecasts will get their final tuning soon.
- Verification of the turbulence, icing and cumulonimbus areas has been carried out against processed satellite imagery and aircraft observations of turbulence.
- The new SIGWX is “tuned” to give the best verification scores (i.e. highest level of skill) and is not trying to directly match the existing hand drawn SIGWX forecast.

Both WAFC's are liaising with their State regulators to file a difference against the applicable Annex 3 provisions to notify airspace users of the changes to the T+24 SIGWX forecasts during the period 26 November 2024 to November 2025 (when Amendment 83 to Annex 3 becomes effective).

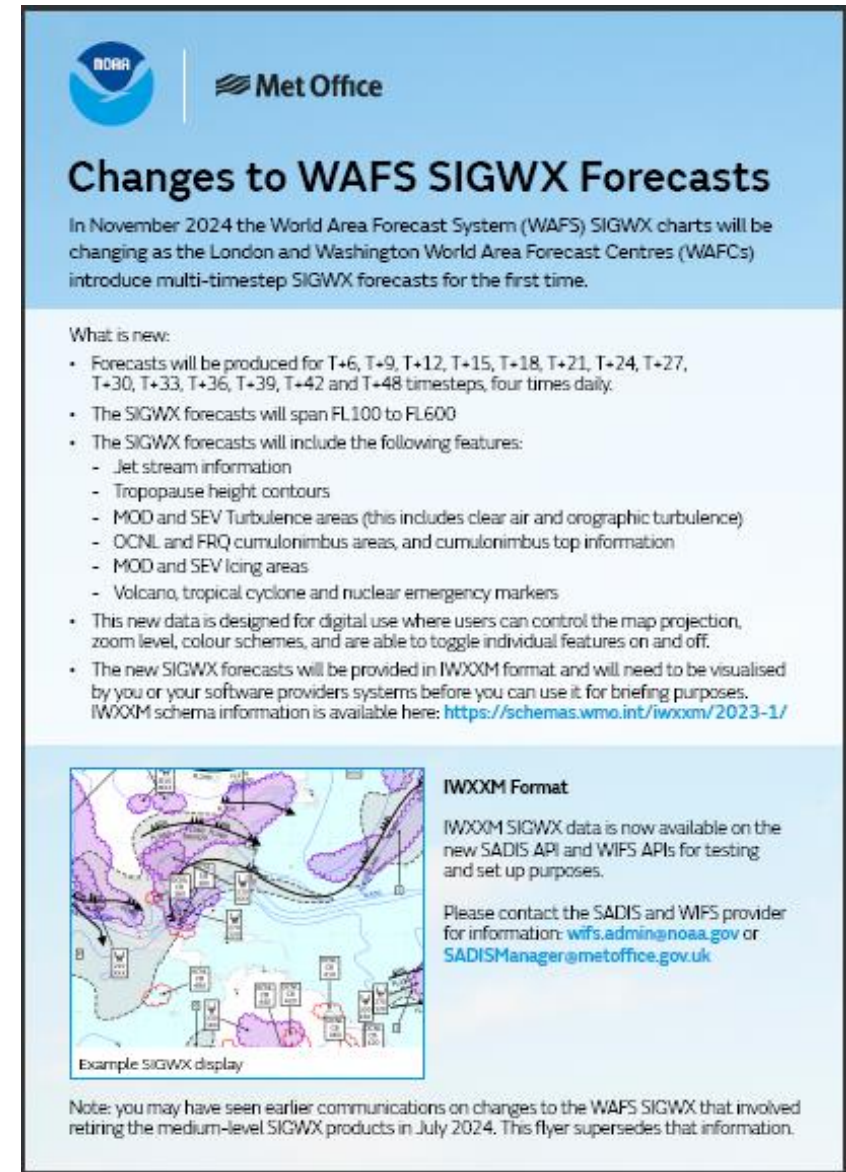
# IMPORTANT

It is important to prepare for the upcoming SIGWX changes now.

Please share the flyer with your State regulator, airlines, operators, flight planning organisations and others in the aviation industry to make them aware of the upcoming changes – especially the changes to the T+24 SIGWX charts

Further information

<https://www.metoffice.gov.uk/services/transport/aviation/regulated/wafs-2023>



**Changes to WAFS SIGWX Forecasts**

In November 2024 the World Area Forecast System (WAFS) SIGWX charts will be changing as the London and Washington World Area Forecast Centres (WAFCs) introduce multi-timestep SIGWX forecasts for the first time.


What is new:

- Forecasts will be produced for T+6, T+9, T+12, T+15, T+18, T+21, T+24, T+27, T+30, T+33, T+36, T+39, T+42 and T+48 timesteps, four times daily.
- The SIGWX forecasts will span FL100 to FL600
- The SIGWX forecasts will include the following features:
  - Jet stream information
  - Tropopause height contours
  - MOD and SEV Turbulence areas (this includes clear air and orographic turbulence)
  - OCNL and FRQ cumulonimbus areas, and cumulonimbus top information
  - MOD and SEV icing areas
  - Volcano, tropical cyclone and nuclear emergency markers
- This new data is designed for digital use where users can control the map projection, zoom level, colour schemes, and are able to toggle individual features on and off.
- The new SIGWX forecasts will be provided in IWXXM format and will need to be visualised by you or your software providers systems before you can use it for briefing purposes. IWXXM schema information is available here: <https://schemas.wmo.int/iwxxm/2023-1/>

**IWXXM Format**

IWXXM SIGWX data is now available on the new SADIS API and WIFS APIs for testing and set up purposes.

Please contact the SADIS and WIFS provider for information: [wifs.admin@noaa.gov](mailto:wifs.admin@noaa.gov) or [SADISManager@metoffice.gov.uk](mailto:SADISManager@metoffice.gov.uk)



Example SIGWX display

Note: you may have seen earlier communications on changes to the WAFS SIGWX that involved retiring the medium-level SIGWX products in July 2024. This flyer supersedes that information.

WAFC London will be running 3 webinars which will cover the same material as this presentation. Please share the sign-up links below with the operators, flight planning companies and other relevant stakeholders in your State.

Webinar Date	Sign-up link
23 July 2024 08:00 - 09:00 UTC	<a href="https://events.teams.microsoft.com/event/8970440d-1bb7-4212-b1a7-266b8e710ada@17f18161-20d7-4746-87fd-50fe3e3b6619">https://events.teams.microsoft.com/event/8970440d-1bb7-4212-b1a7-266b8e710ada@17f18161-20d7-4746-87fd-50fe3e3b6619</a>
6 August 2024 15:00 - 16:00 UTC	<a href="https://events.teams.microsoft.com/event/3e0a2ae6-4f5b-4585-a83a-924e57806d9d@17f18161-20d7-4746-87fd-50fe3e3b6619">https://events.teams.microsoft.com/event/3e0a2ae6-4f5b-4585-a83a-924e57806d9d@17f18161-20d7-4746-87fd-50fe3e3b6619</a>
8 August 2024 08:00 - 09:00 UTC	<a href="https://events.teams.microsoft.com/event/3c45eddc-956f-4744-90c3-9786dbd5c946@17f18161-20d7-4746-87fd-50fe3e3b6619">https://events.teams.microsoft.com/event/3c45eddc-956f-4744-90c3-9786dbd5c946@17f18161-20d7-4746-87fd-50fe3e3b6619</a>





Thank you for listening

For further information contact:

[wifs.admin@noaa.gov](mailto:wifs.admin@noaa.gov)

or

[SADISManager@metoffice.gov.uk](mailto:SADISManager@metoffice.gov.uk)

*If you already use SADIS or WIFS please contact the provider of the system you currently use.*