Quantitative Volcanic Ash

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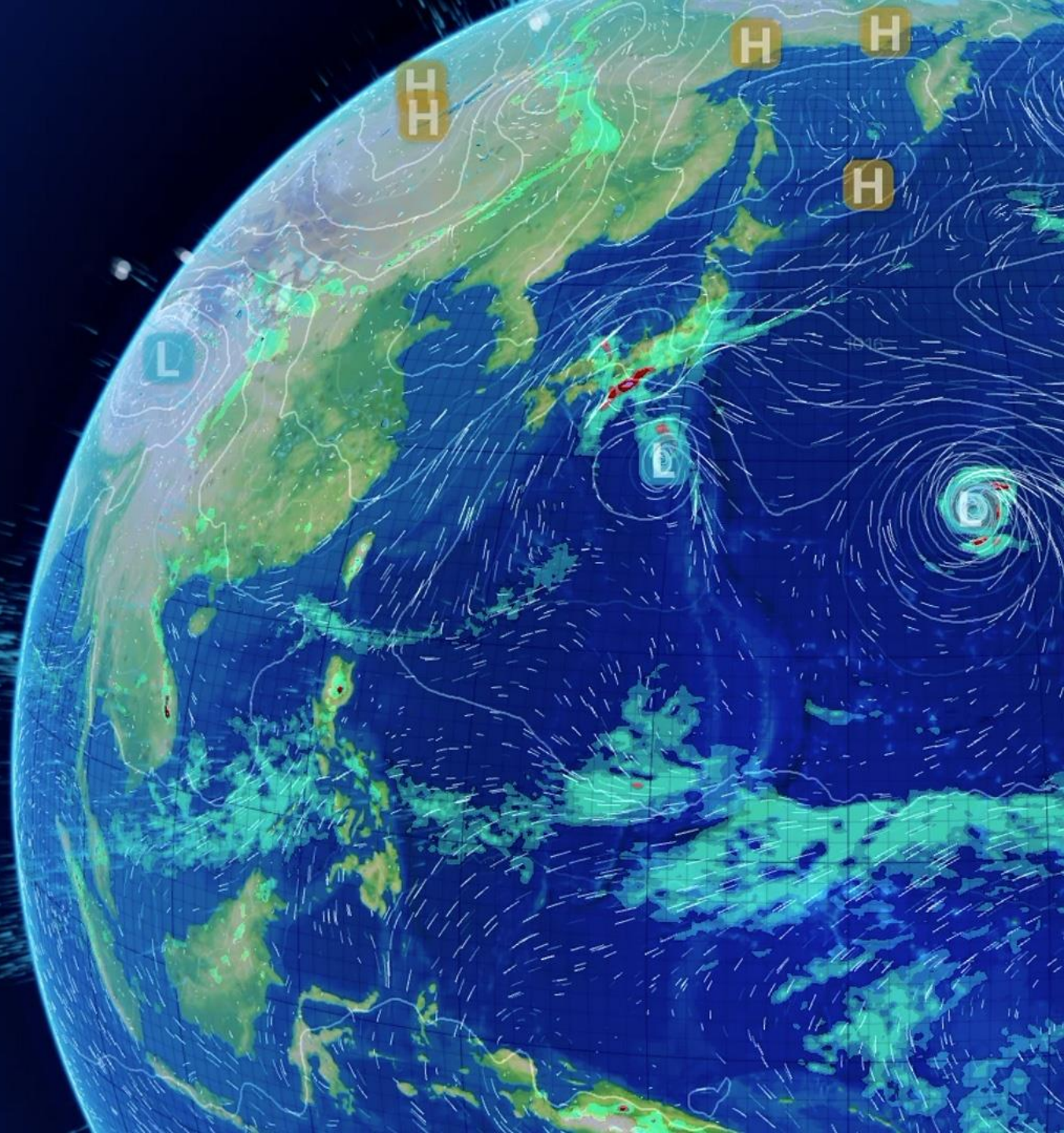
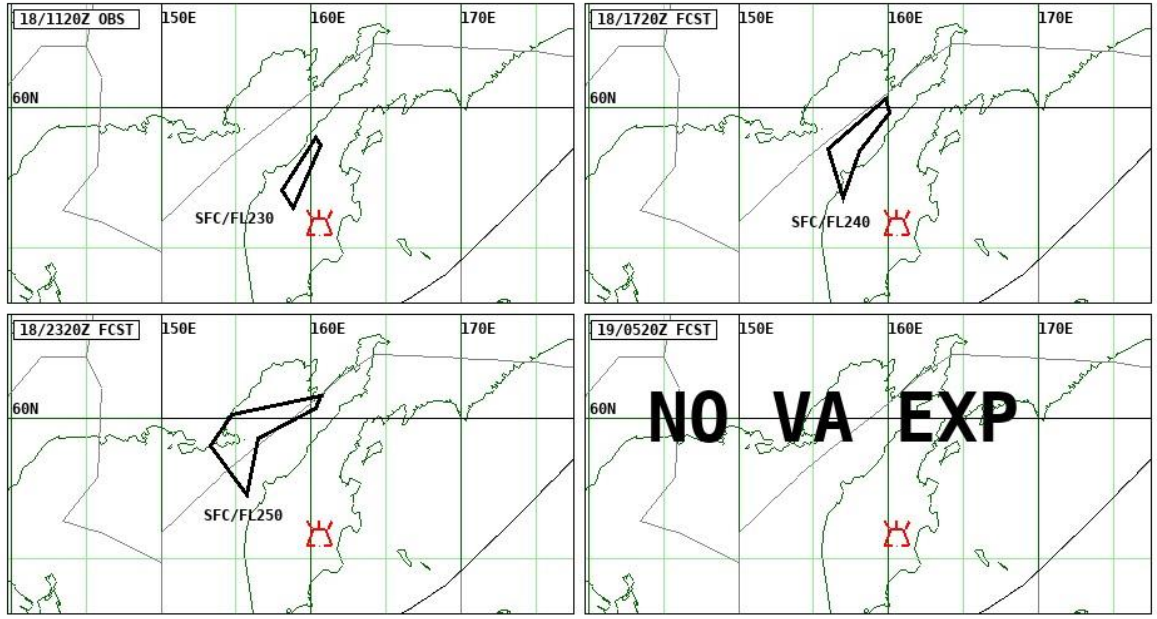
International Aviation Manager



Volcanic Ash Forecasts

At present, ICAO mandated Volcanic Ash forecasts are:



VA ADVISORY
DTG: 20231018/1200Z
VAAC: TOKYO
VOLCANO: BEZYMIANNY 300250
AREA: RUSSIA
SUMMIT ELEV: 2882M
ADVISORY NR: 2023/38
INFO SOURCE: HIMAWARI-9
AVIATION COLOUR CODE: NIL

ERUPTION DETAILS: VA CONTINUOUSLY OBS IN SATELLITE IMAGERY
RMK: SOME PART OF VA OBSCURED BY MET CLOUD. VA HEIGHT UPDATED TO FL230 BASED ON SATELLITE DATA.
NXT ADVISORY: 20231018/1800Z

FVXX22 KNES 180646

VA ADVISORY

DTG: 20231018/0646Z

VAAC: WASHINGTON

VOLCANO: REVENTADOR 352010

PSN: S0005 W07739

AREA: ECUADOR

SUMMIT ELEV: 11686 FT (3562 M)

ADVISORY NR: 2023/679

INFO SOURCE: GOES-16. NWP MODELS.

ERUPTION DETAILS: OCNL EM

OBS VA DTG: 18/0620Z

OBS VA CLD: SFC/FL150 N0001 W07743 - S0004 W07738 - S0006 W07741 - S0002 W07746 - N0001 W07743 MOV NW 10KT

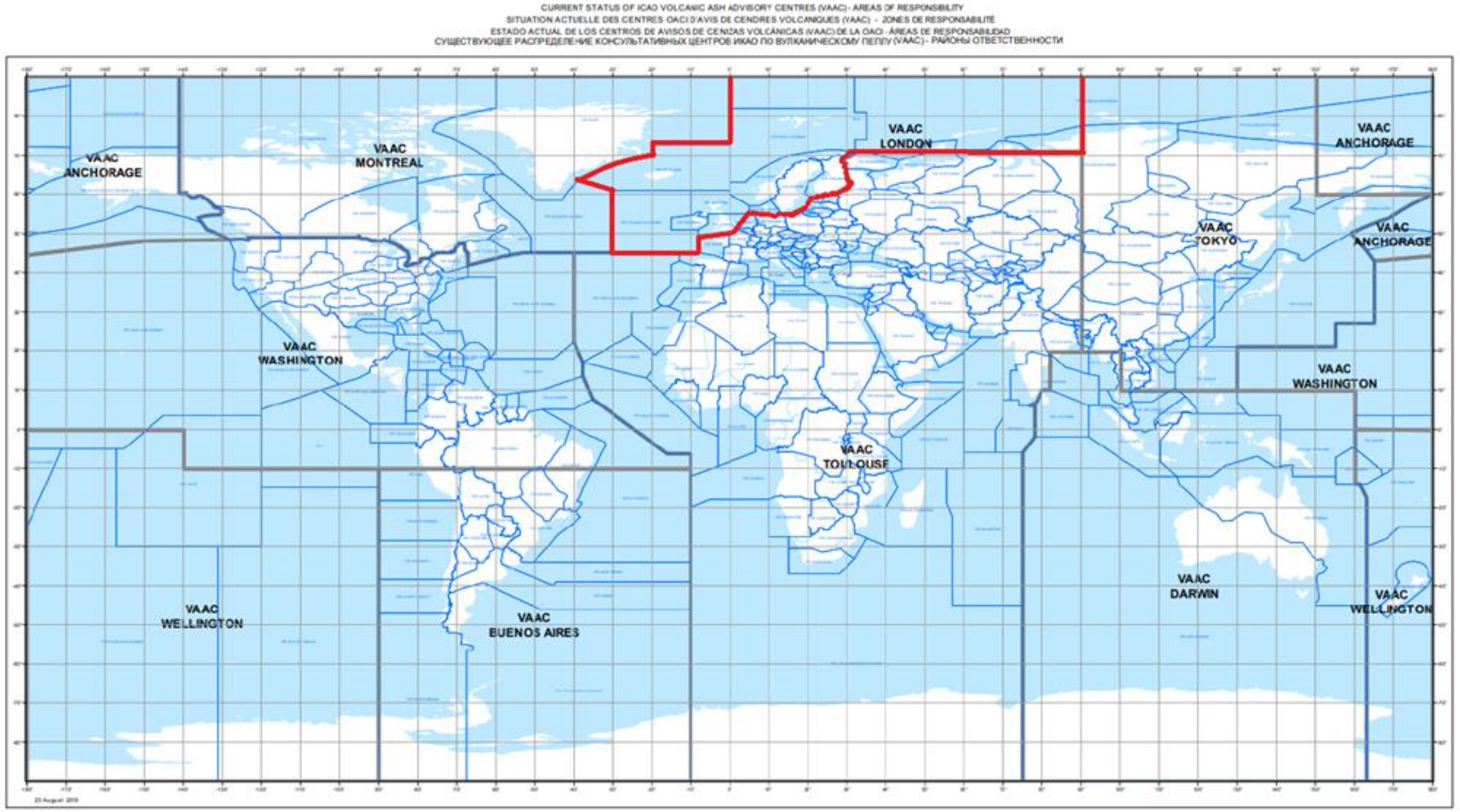
FCST VA CLD +6HR: 18/1230Z SFC/FL150 N0004 W07752 - S0004 W07738 - S0007 W07740 - S0000 W07755 - N0004 W07752

FCST VA CLD +12HR: 18/1830Z SFC/FL150 N0005 W07751 - S0004 W07738 - S0006 W07740 - N0001 W07754 - N0005 W07751

FCST VA CLD +18HR: 19/0030Z SFC/FL150 N0004

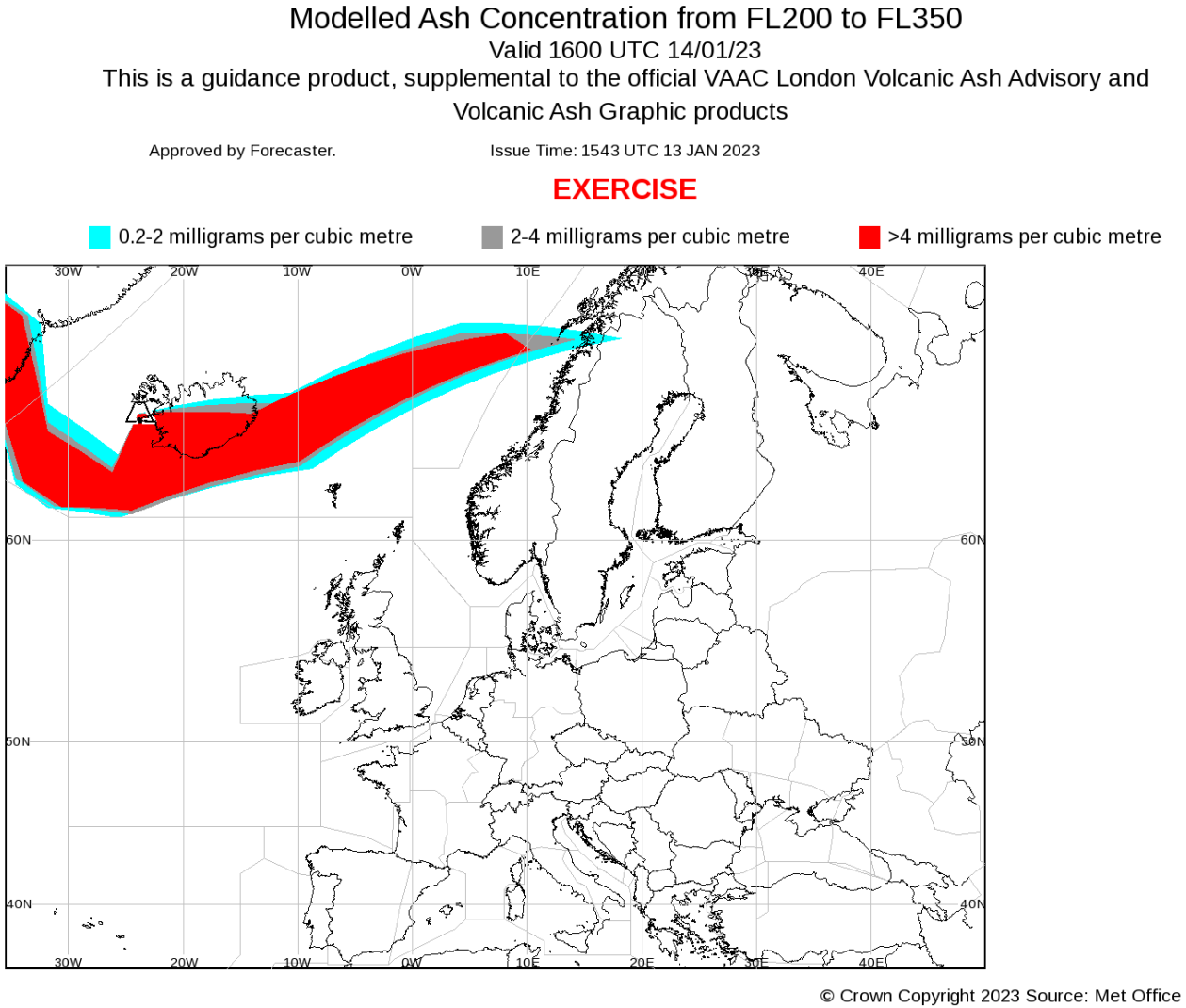
Volcanic Ash Forecasts

Are provided by 9 Volcanic Ash Advisory Centres (VAACs)



Volcanic Ash Forecasts

- Since 2010 VAAC London and VAAC Toulouse have provided ash concentration forecasts
- Data provided as charts, and simple data files
- Frustration for the customers/stakeholders outside of Europe where these products are not available.



This product has three vertical levels, three concentration bands and four timesteps

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Quantitative Volcanic Ash (QVA)

A new provision to provide more advanced volcanic ash forecasting is being introduced into Annex 3 with Amendment 82 and the new PANS-MET (First edition) on 27 November 2025

A work stream under the ICAO Met Panel has been defining the requirements for a new quantitative volcanic ash (QVA) information service. This group includes IATA, and aircraft engine manufacturers

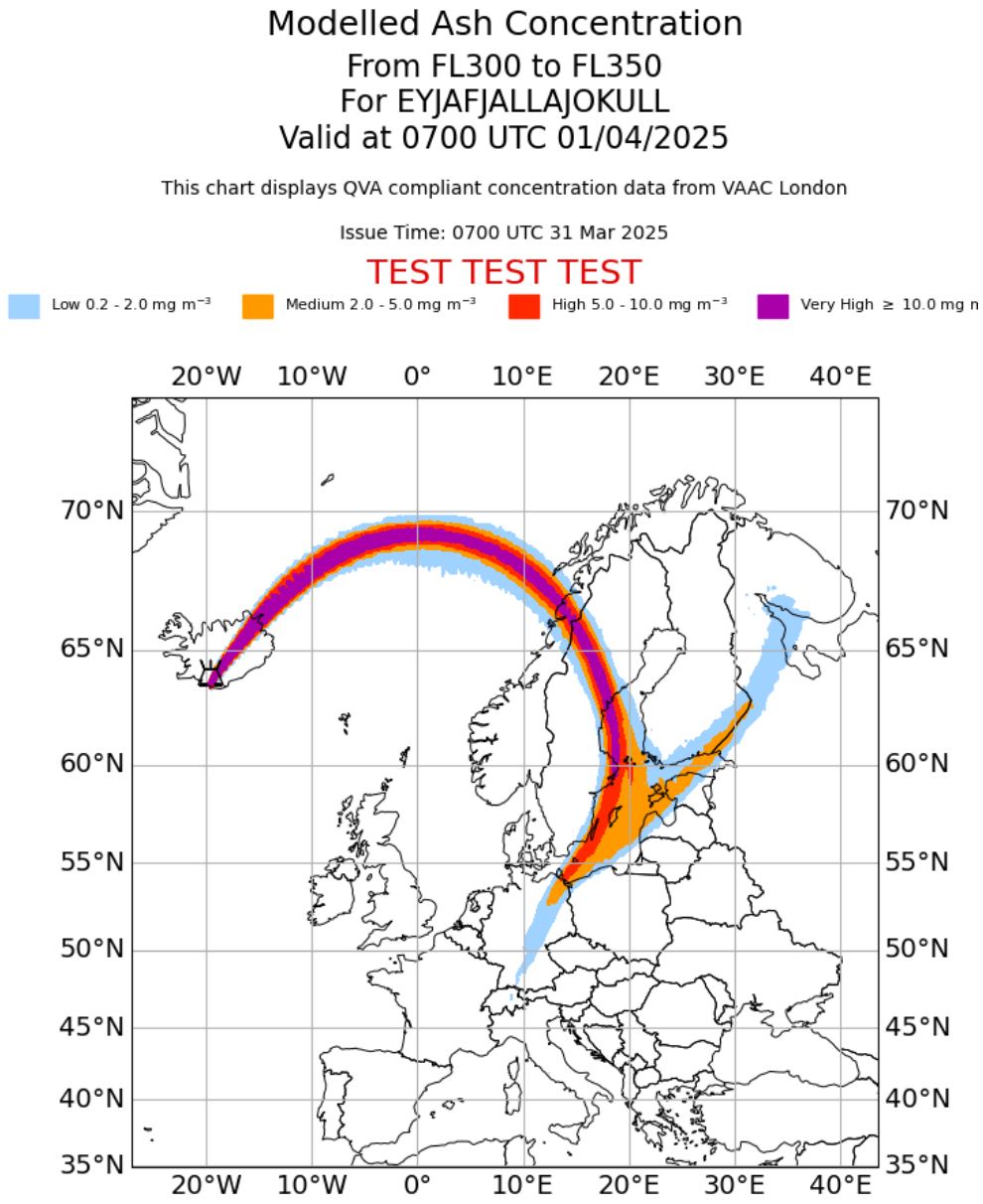
QVA information offers operators the opportunity to move away from traditional discernible ash criteria and instead use certified engine susceptibility for flight route planning and inflight replanning.

What are the QVA data sets?

Deterministic gridded data

- Gives the expected ash concentration

Descriptor	Concentration thresholds and ranges
Very Low	<0.2 mg/m^3
Low	≥0.2 to <2 mg/m^3
Medium	≥2 to <5 mg/m^3
High	≥5 to <10 mg/m^3
Very high	≥10 mg/m^3

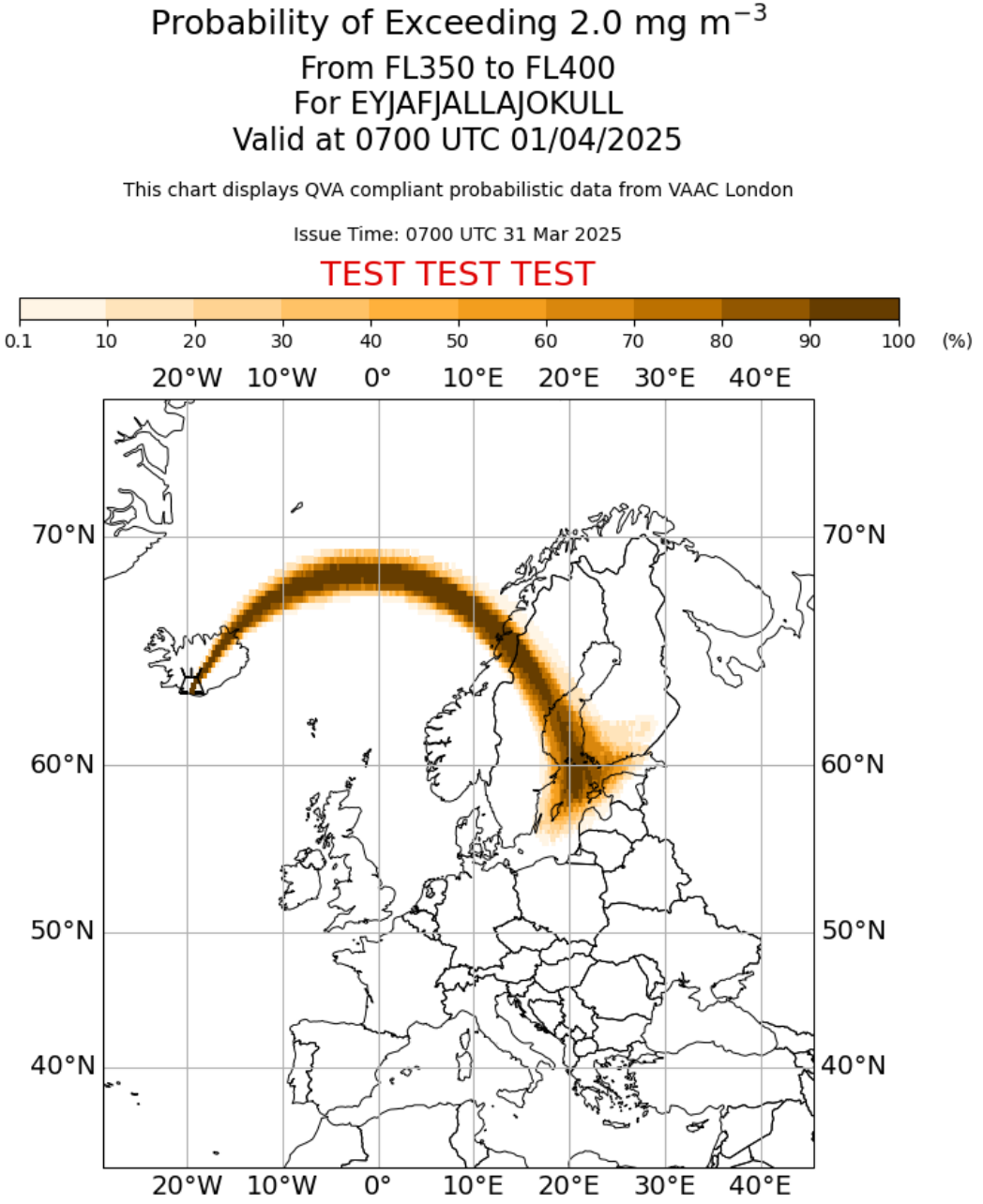


What are the QVA data sets?

Probabilistic gridded data

- Gives the probability that the ash concentration these thresholds

Concentration thresholds
≥0.2 mg/m³
≥2.0 mg/m³
≥5.0 mg/m³
≥10.0 mg/m³



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What are the QVA data sets?

- Gridded data will be provided for 12 vertical levels (FL000 to FL600 at 5000ft intervals) at 0.25-degree latitude/longitude horizontal resolution

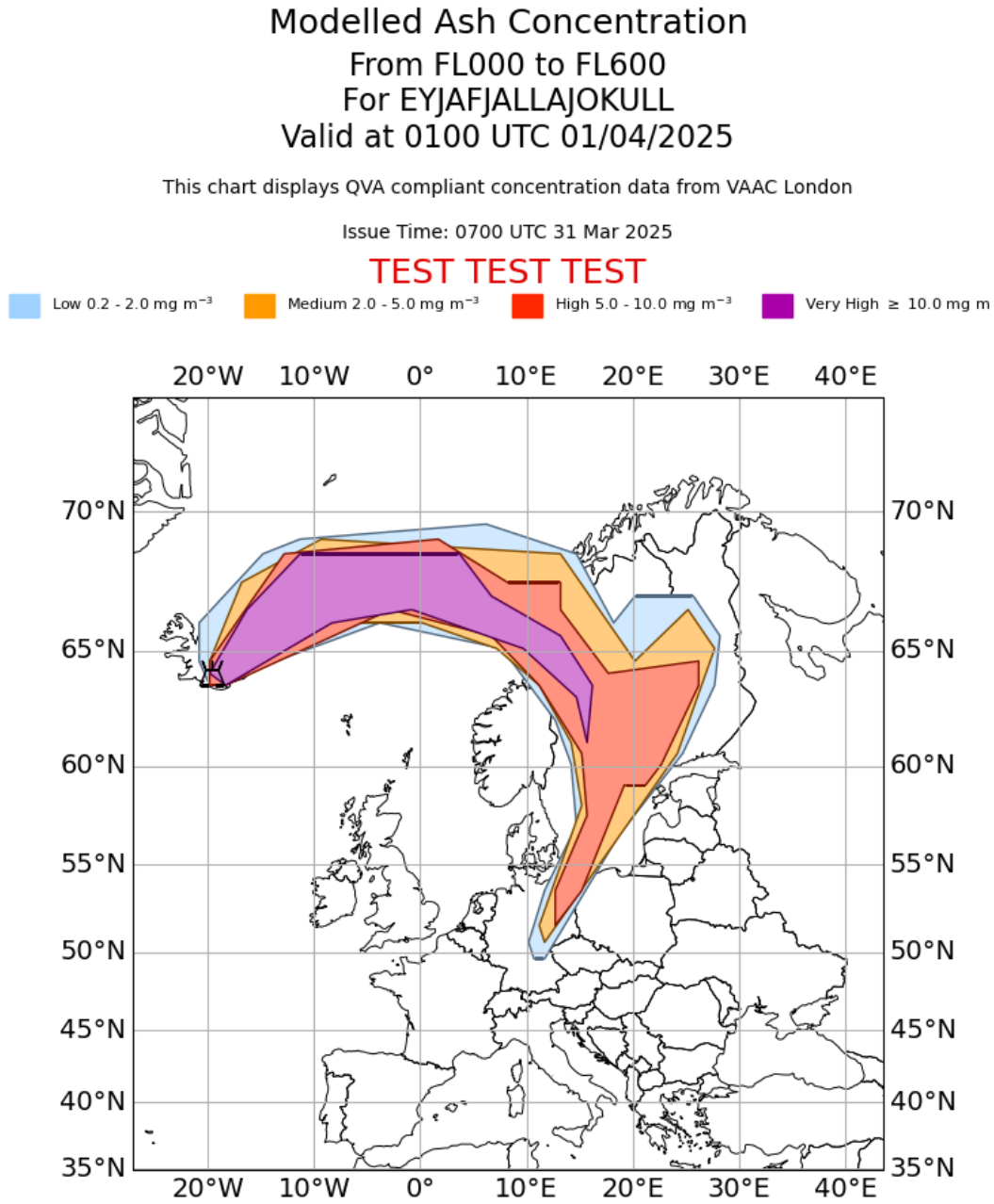
From mean sea level to and including flight level (FL) 50
Above FL 50 to and including FL 100
Above FL 100 to and including FL 150
Above FL 150 to and including FL 200
Above FL 200 to and including FL 250
Above FL 250 to and including FL 300
Above FL 300 to and including FL 350
Above FL 350 to and including FL 400
Above FL 400 to and including FL 450
Above FL 450 to and including FL 500
Above FL 500 to and including FL 550
Above FL 550 to and including FL 600

- Timesteps: T+0 to T+24 at 3-hourly intervals

What are the QVA data sets?

- Ash polygons with attributes (a bit like WAFS SIGWX).
- Calculated from the deterministic QVA forecast
- Data in IWXXM format

- Data only issued for “significant” eruptions originating in the VAAC London area of responsibility. Data will cover the whole plume, however big it gets.



QVA Data Demonstration

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When and how will the QVA forecasts be provided?

- QVA forecasts will only issued for “significant” eruptions
- Forecast will be updated at 6 hr intervals during an ongoing eruption

- The originating VAAC will cover the whole plume, however big it gets and wherever it goes.

- Data will be provided by each VAAC via API
- The VAACs have agreed to use a consistent technical approach, similar to what VAAC London has built. This is technically very similar to the SADIS API.

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VAAC London QVA API

- Expected to become semi-operational late July 2025, and fully operational Nov 2027.
- Beta testing phase taking place right now
- No eruptions right now, so we are publishing test data sets (simulated eruptions)

- Confirms to the Open Geospatial Consortium Environmental Retrieval API standards
- Comprises of a REST API and notifications service

- API conforms to EUROCONTROL SWIM yellow profile
- API will be published in EUROCONTROL SWIM registry once operational

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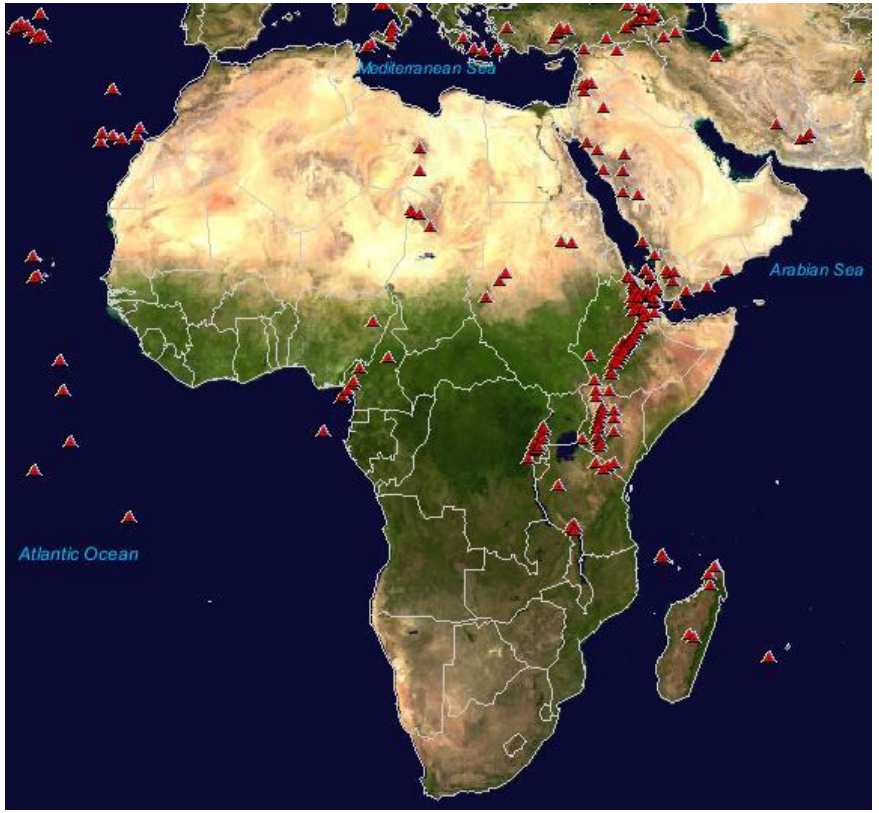
VAAC Toulouse QVA API

- Expected to become operational late November 2025.
- Will cover any significant volcanic eruptions originating in Africa and most of Europe



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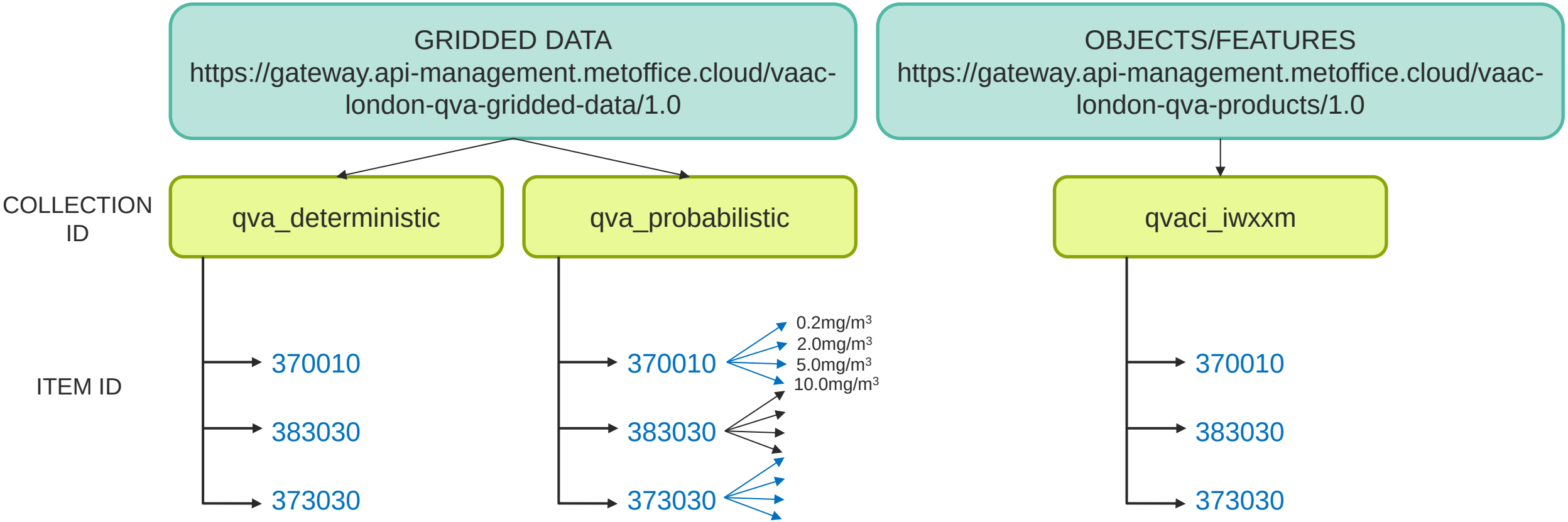
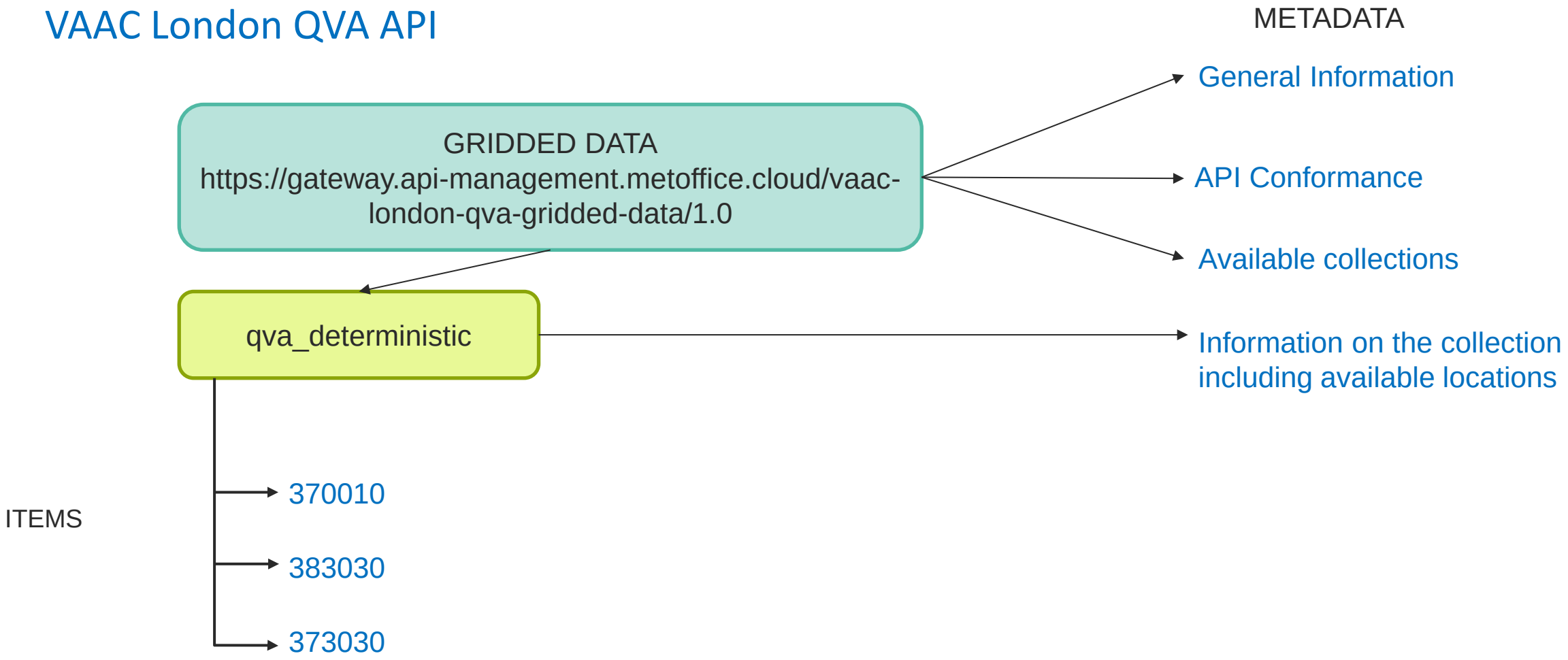
VAAC London QVA API



VAAC London QVA API



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VAAC London Notifications Service

- ActiveMQ Message broker with four topics that can be subscribed to.
- The Notification message contains the information on the volcano name, volcano number, publish time and the data (event) type.
- In addition a heartbeat (empty) message will be published every hour.

```
{
    "id": "740e5834-3a29-46b4-9a6f-16142fde533a",
    "pubtime": "2024-04-08T17:04:43.330256",
    "type": "Feature",
    "geometry": null,
    "properties": {
      "operation": "update",
      "vaac_id": "EGRR",
      "event_type": "OPERATIONAL",
      "sources": [
        {
          "volcano_id": "370010",
          "volcano_name": "SNAEFELLSJOKULL"
        }
      ]
    },
    "links": [
      {
        "href": https://api-management.metoffice.cloud/qva-service/1.0/collections/qva_deterministic,
        "rel": "collection",
        "type": "application/json"
      }
    ]
}
```

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Who can access to the VAAC London QVA API?

- Legitimate aviation industry users worldwide
- Registration process: registration form, and acceptance of service terms and conditions.

- Access controlled through a Met Office API management developer portal where consumer keys can be generated.

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Thank you for listening

For further information contact:

QVA@metoffice.gov.uk