Introduction to MeteoGate

Jeremy Tandy *Vice-Chair WMO/INFCOM/SC-IMT*

EUMETNET

MeteoGate

AN INTRODUCTION

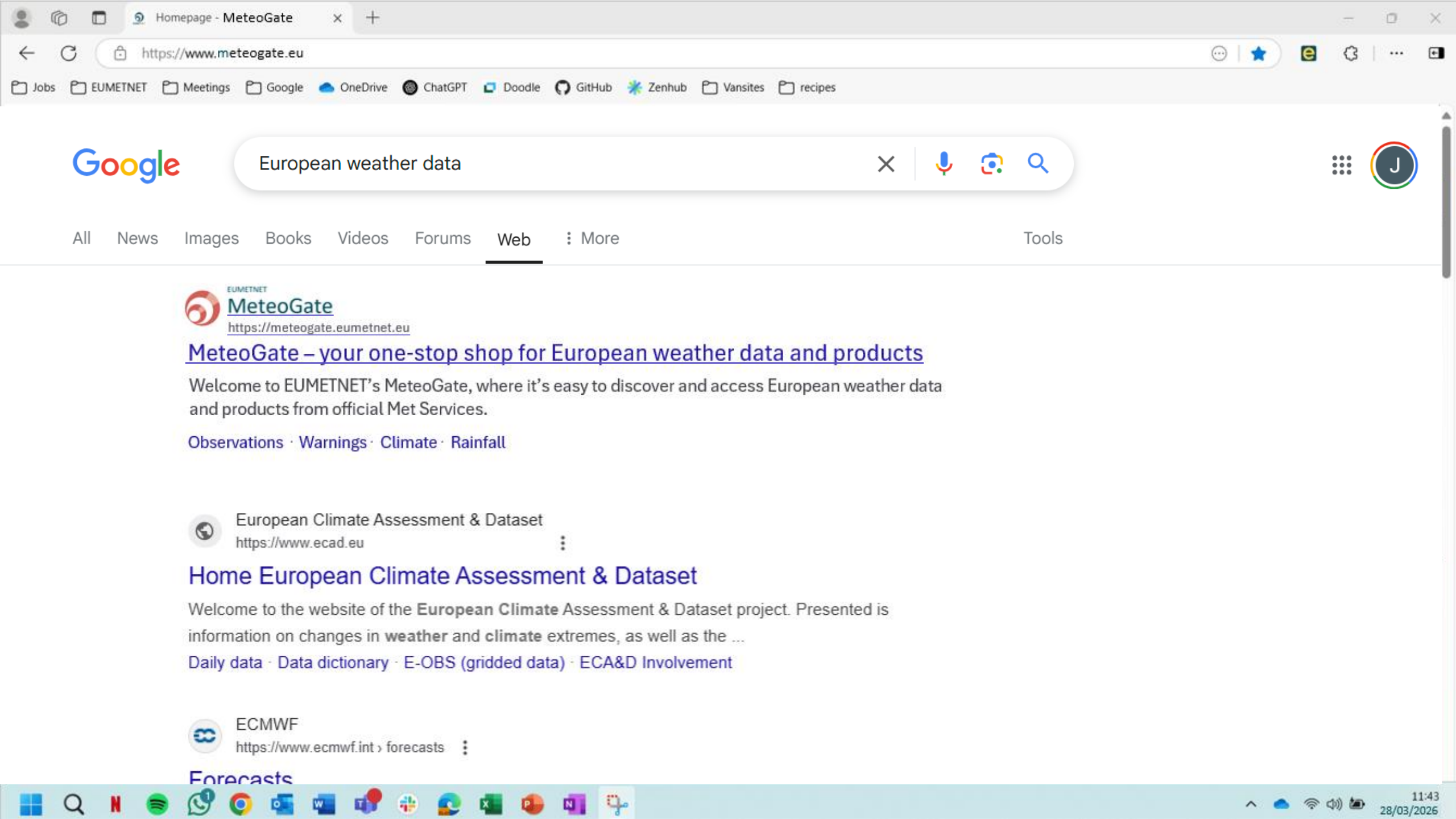
RELATIONSHIP WITH WIS 2.0

- MeteoGate builds on the foundation of WIS 2.0, leveraging the WIS2 Global Services
- MeteoGate Data Supply Component = WIS2 Node
- MeteoGate adds:
  - standardized interactive Web-services (APIs) to query and access data
  - Web-application to discover datasets and interact with data provided by API

SOME KEY TERMS / ACRONYMS

- MeteoGate: The data sharing system
- RODEO: The project developing MeteoGate's Community Components and the APIs, with 50% EU funding
- FEMDI: The EUMETNET Programme which is developing, and will run, MeteoGate
- FMI: The Finnish Meteorological Institute – the NMS who will be operating and maintaining MeteoGate from 2026 - 2028

Let's take you through the user experience to show you what RODEO will be providing…


Homepage - MeteoGate
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Vansites
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Videos
Forums
Web
More
Tools
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MeteoGate
https://meteogate.eumetnet.eu
MeteoGate – your one-stop shop for European weather data and products
Welcome to EUMETNET's MeteoGate, where it's easy to discover and access European weather data and products from official Met Services.
Observations · Warnings · Climate · Rainfall
European Climate Assessment & Dataset
https://www.ecad.eu
Home European Climate Assessment & Dataset
Welcome to the website of the European Climate Assessment & Dataset project. Presented is information on changes in weather and climate extremes, as well as the ...
Daily data · Data dictionary · E-OBS (gridded data) · ECA&D Involvement
ECMWF
https://www.ecmwf.int › forecasts
Forecasts
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Homepage - MeteoGate

https://www.meteogate.eu

https://meteogate.eu/

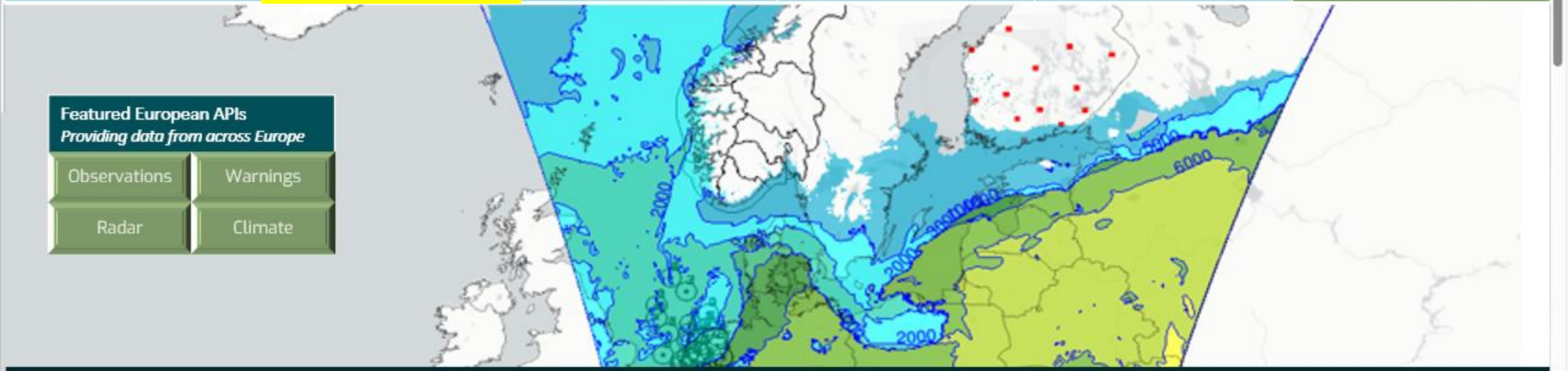
Beta Website – to be finalized during December 2025

Jobs | EUMETNET | Meetings | Google | OneDrive | ChatGPT | Doodle | GitHub | Zenhub | Vansites

EUMETNET MeteoGate *Discover and access European meteorological data and information*

Co-funded by the European Union

Overview | Data Explorer | Europe APIs | API keys | Support | EUMETNET MEMBERS



Featured European APIs
Providing data from across Europe

Observations | Warnings | Radar | Climate

EUMETNET

National Met Services from the following 33 countries are EUMETNET Members

Our Partner Organisations

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ECMWF
EUROCONTROL
EEA
EUROGOOS
EPOS
EMS

Contact us

EUMETNET SNC
c/o L'Institut Royal Météorologique
Avenue Circulaire 3
1180 Brussels, Belgium

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E-mail: info[at]eumetnet.eu

Legal information

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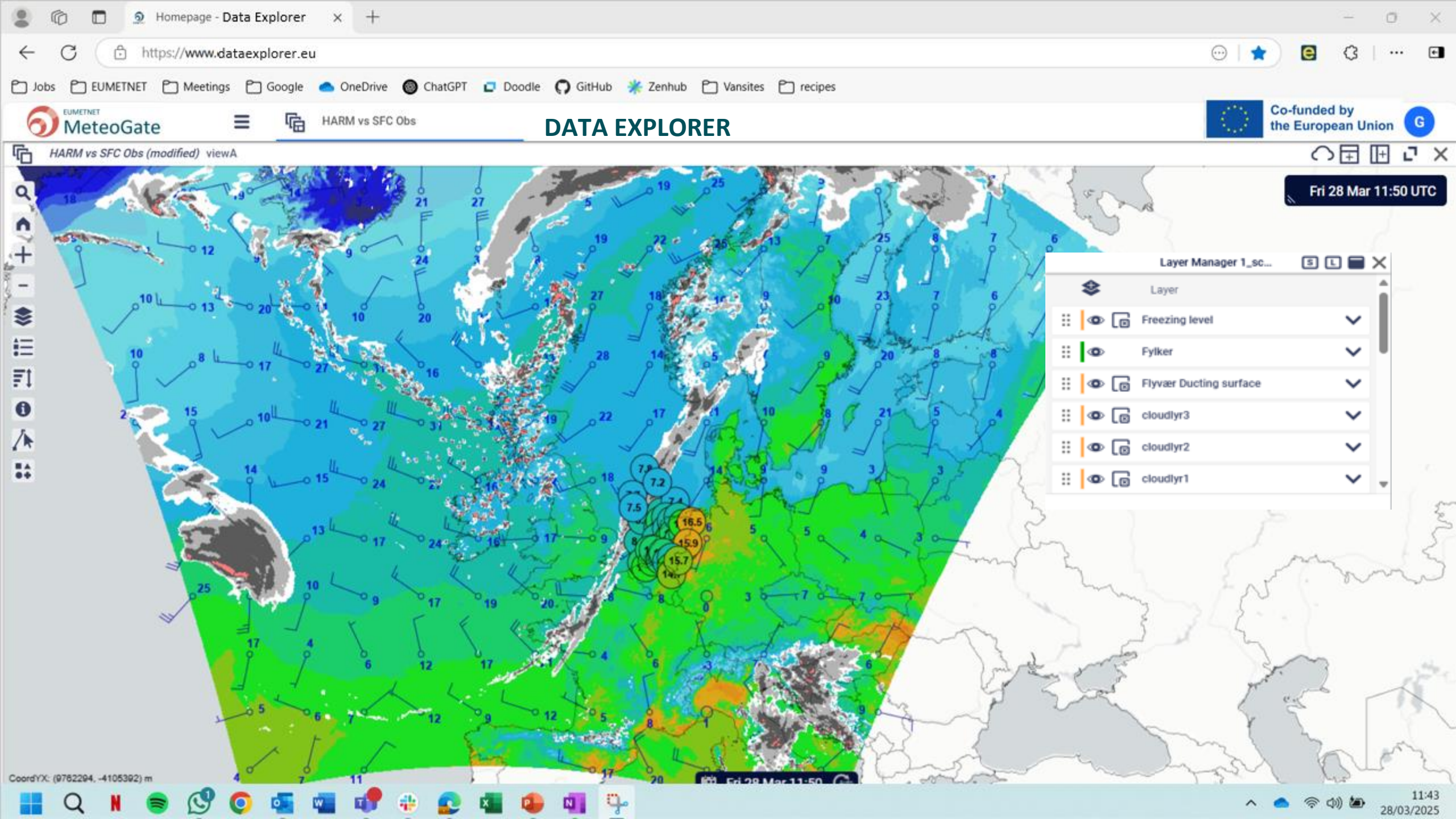
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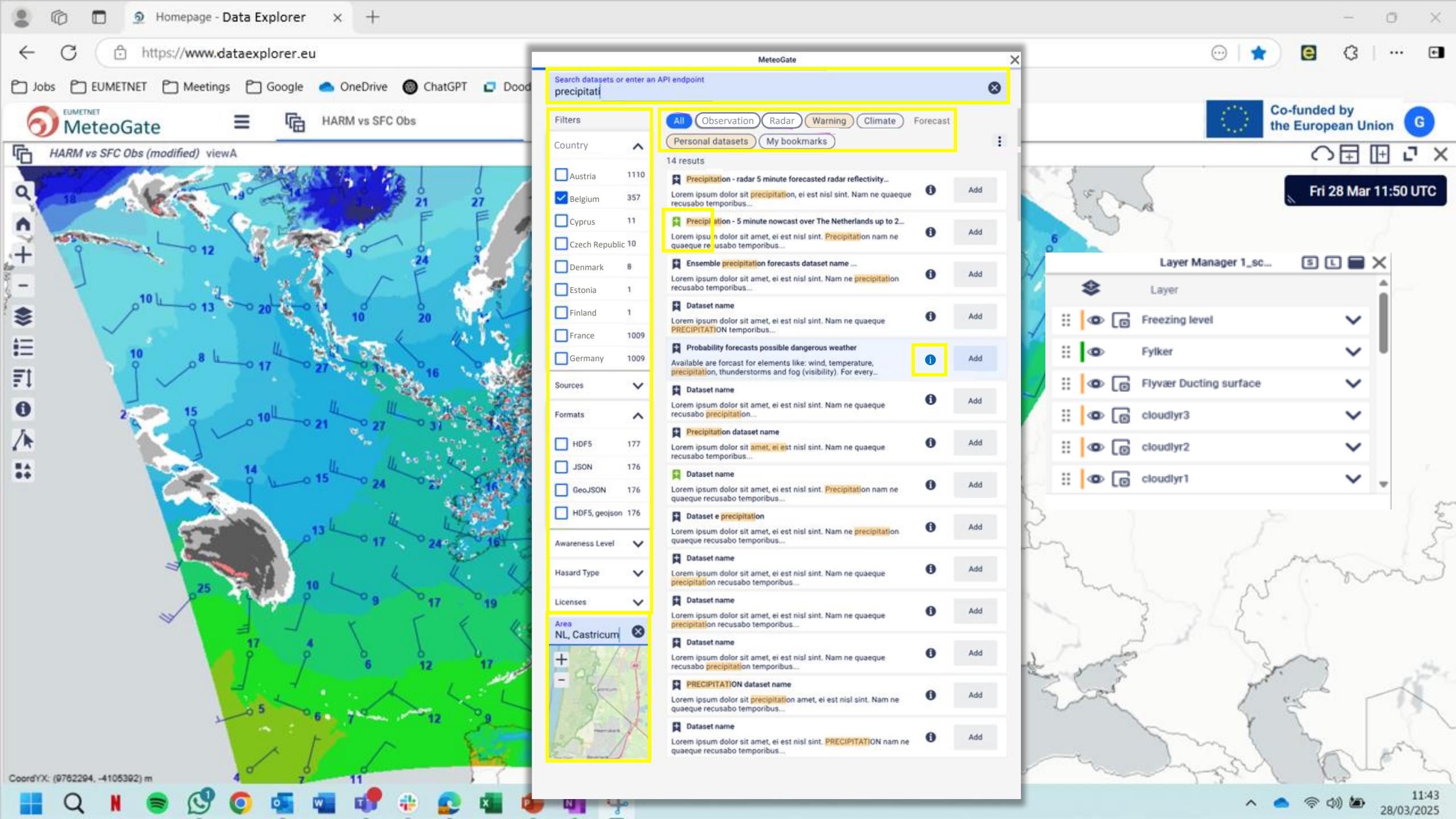
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MeteoGate
Search datasets or enter an API endpoint
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Filters
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Belgium 357
Cyprus 11
Czech Republic 10
Denmark 8
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Finland 1
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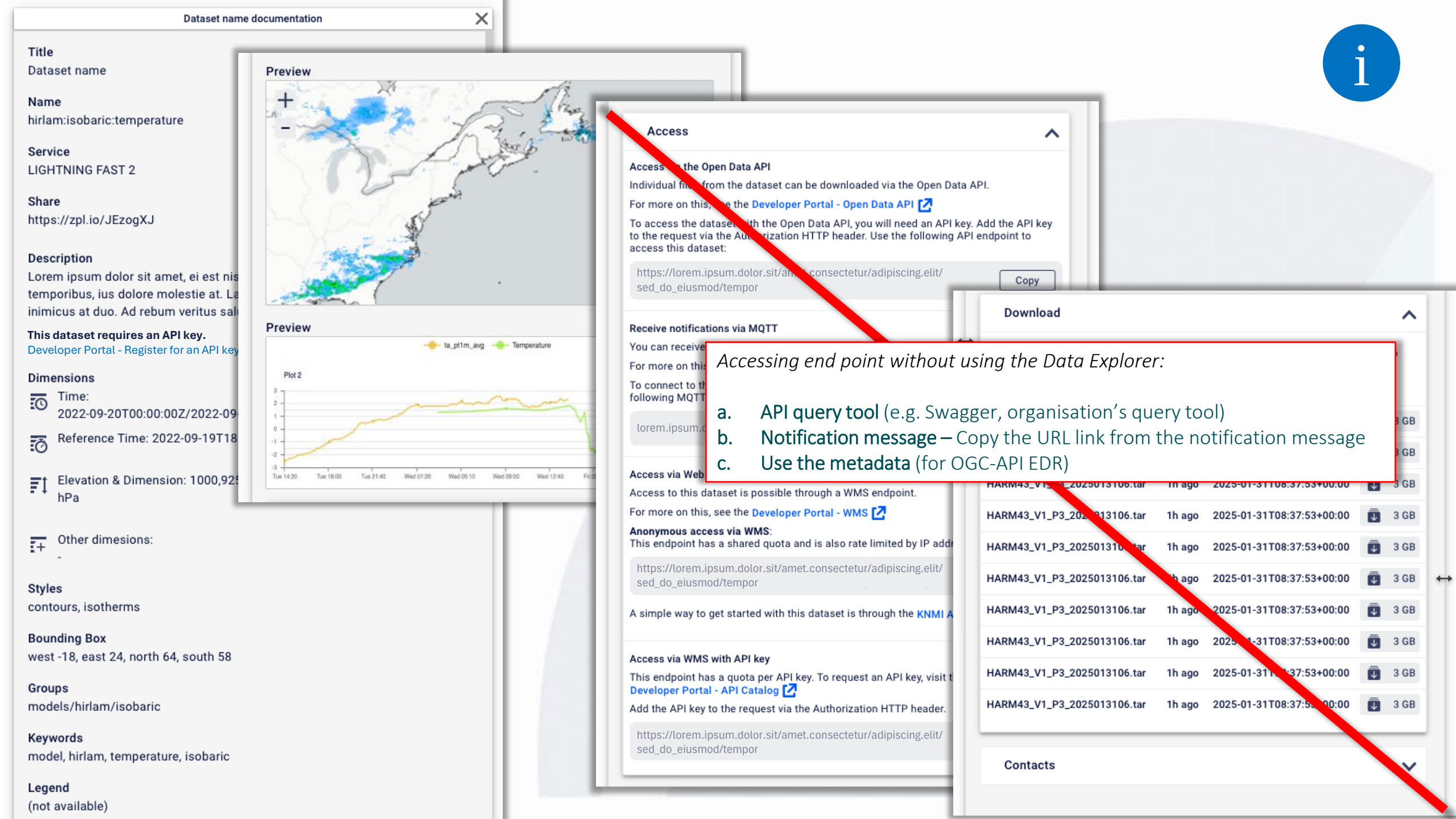
Dataset name documentation
Title
Dataset name
Name
hirlam:isobaric:temperature
Service
LIGHTNING FAST 2
Share
https://zpl.io/JEzogXJ
Description
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temporibus, ius dolore molestie at. La
inimicus at duo. Ad rebum veritus sal
This dataset requires an API key.
Developer Portal - Register for an API key
Dimensions
Time:
2022-09-20T00:00:00Z/2022-09
Reference Time: 2022-09-19T18
Elevation & Dimension: 1000,925
hPa
Other dimesions:
-
Styles
contours, isotherms
Bounding Box
west -18, east 24, north 64, south 58
Groups
models/hirlam/isobaric
Keywords
model, hirlam, temperature, isobaric
Legend
(not available)
Preview
Preview
ta_pt1m_avg
Temperature
Plot 2
Access
Access the Open Data API
Individual files from the dataset can be downloaded via the Open Data API.
For more on this, see the Developer Portal - Open Data API
To access the dataset with the Open Data API, you will need an API key. Add the API key to the request via the Authorization HTTP header. Use the following API endpoint to access this dataset:
https://lorem.ipsum.dolor.sit/amet.consectetur/adipiscing.elit/sed_do_eiusmod/tempor
Copy
Receive notifications via MQTT
You can receive
For more on this
To connect to th
following MQTT
lorem.ipsum.
Access via Web
Access to this dataset is possible through a WMS endpoint.
For more on this, see the Developer Portal - WMS
Anonymous access via WMS:
This endpoint has a shared quota and is also rate limited by IP addr
https://lorem.ipsum.dolor.sit/amet.consectetur/adipiscing.elit/sed_do_eiusmod/tempor
A simple way to get started with this dataset is through the KNMI A
Access via WMS with API key
This endpoint has a quota per API key. To request an API key, visit t
Developer Portal - API Catalog
Add the API key to the request via the Authorization HTTP header.
https://lorem.ipsum.dolor.sit/amet.consectetur/adipiscing.elit/sed_do_eiusmod/tempor
Download
HARM43_V1_P3_2025013106.tar 1h ago 2025-01-31T08:37:53+00:00 3 GB
Contacts
Accessing end point without using the Data Explorer:
a. API query tool (e.g. Swagger, organisation's query tool)
b. Notification message – Copy the URL link from the notification message
c. Use the metadata (for OGC-API EDR)

APIs users will find

OBSERVATIONS

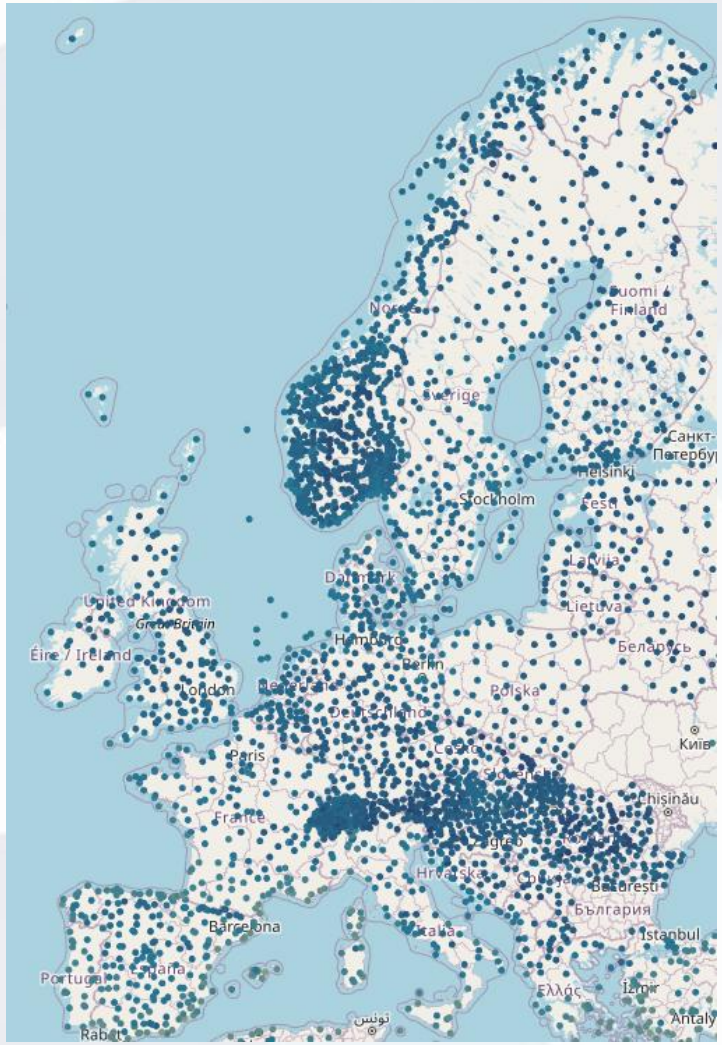
Ready for Members to onboard their surface observations

OBSERVATIONS - *Known as EUMETNET-Supplementary Observations System (E-SOH)*

The operational system ***observations.meteogate.eu*** is being run by DWD in the ECMWF side of the European Weather Cloud (EWC). The system is running stable for ingest and retrieval of data using the following APIs.

- E-SOH ingest API: Developed for easy and structured ingest of observations from NMSs. As JSON structures or BUFR files. NMS needs to be whitelisted to get access to ingest API.
- E-SOH EDR API: Uses the Open Geospatial Consortium (OGC) API for Environmental Data Retrieval (OGC-API EDR) interface for retrieving observations from the system

WIS2.0 integration: Data ingested to E-SOH will be made available for WIS 2.0 through MQTT for real time access.



APIs users will find

WARNINGS

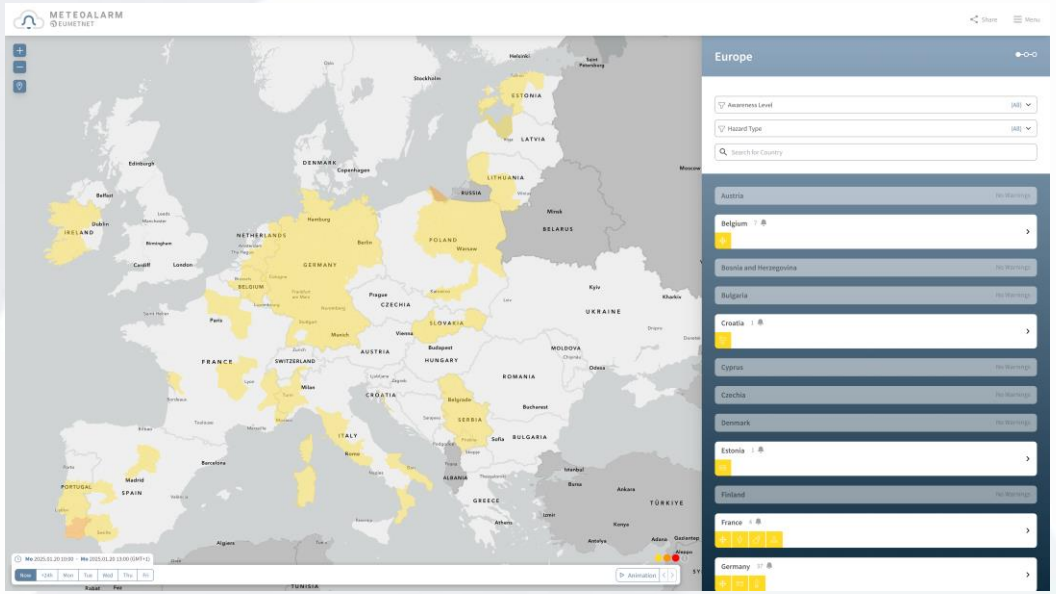
1. **Real-Time Warning API**: Enables users to access and query ongoing early warnings from the participating NMSs of the EMMA Programme and receive notifications.

2. **Archived Warning API**: Enables users to access and query archived early warnings from the participating NMSs of the EMMA Programme.

3. **Storm Name API**: Enables users to match ongoing early warnings with the official name of the storm, including the necessary backend services, provided that the name is included in the CAP message ("storm_name" parameter).

Filter by:

- Country
- Awareness Level
- Hazard Type

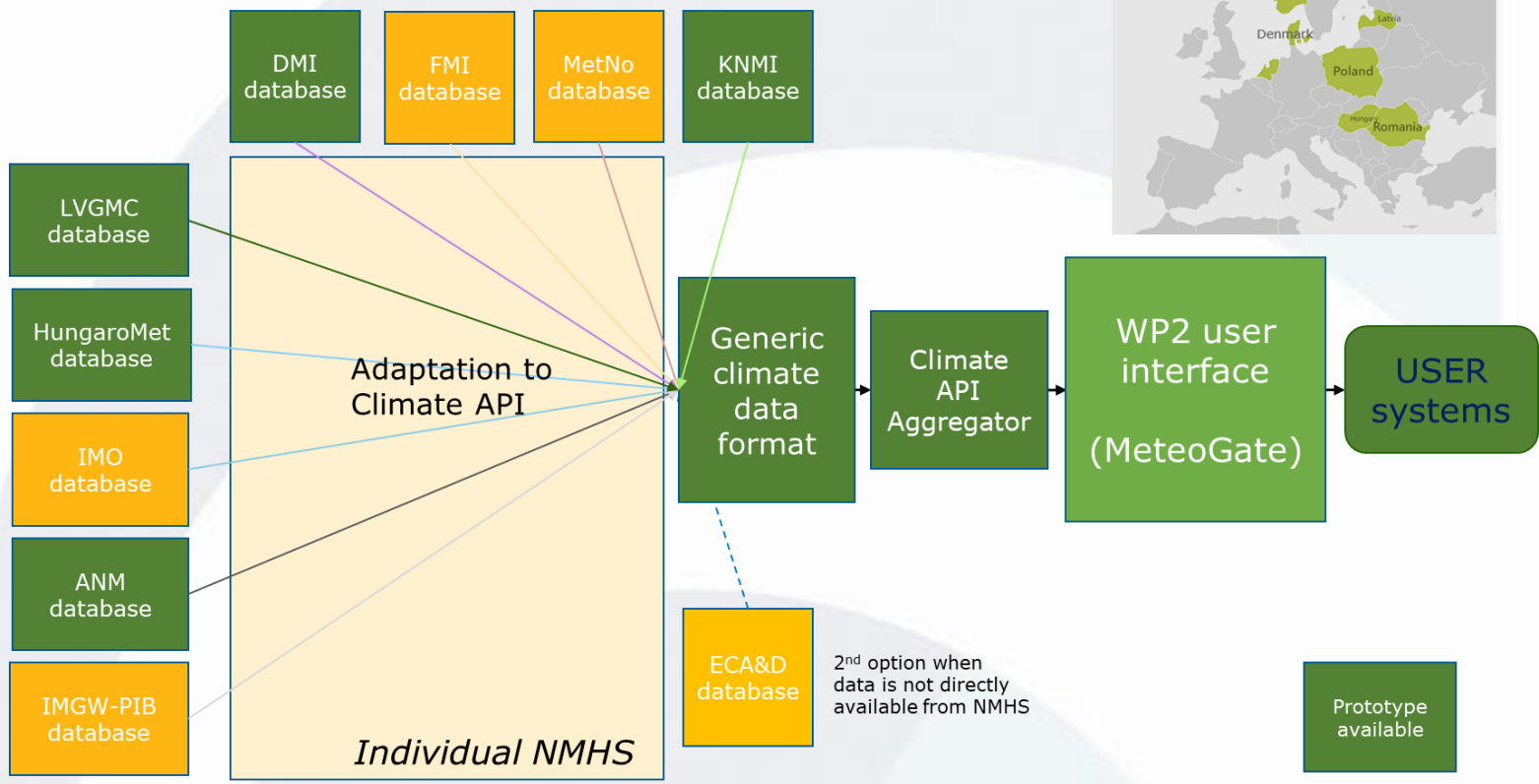


APIs users will find

CLIMATE

Climate APIs: Enables NMSs to share their daily, hourly and sub-hourly data using an OGC-API EDR on their in-situ observational climate data. This allows *data queries in a spatio-temporal* manner. *9 NMSs* are providing an OGC-API EDR on their in-situ observational climate data; Daily data from the European Climate Assessment and Dataset (ECA&D) will be provided for Members without this API.

Climate Aggregator: Wraps climate data from a *subset* of Essential Climate Variables from individual APIs into one output file (CoverageJSON and NetCDF) in a federated manner.



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APIs users will find

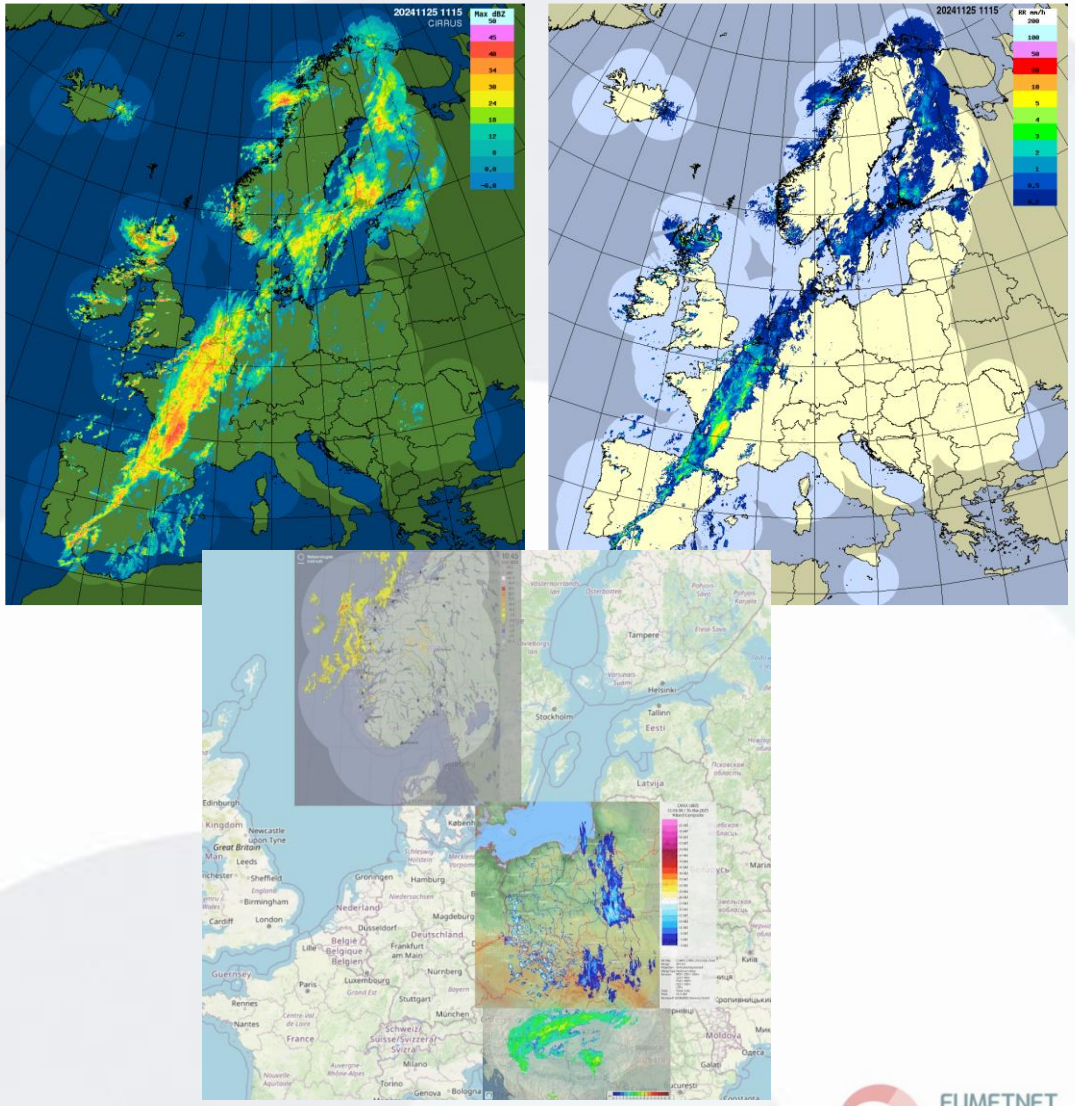
Open Radar Data (ORD)

Open Radar Data (ORD) API including Ingest API and OGC-API EDR allow

- OPERA to make the **European single site radar data** and the **OPERA composite products** available for downloading.
- Demonstration of **national products** to be made available (providing a link) via national interfaces for download.
- Provides NMSs to fulfil their HVD requirements with their radar data

The service ORD API is planned to be operational in Q4/2025.

WIS2.0 integration: Data ingested to ORD could be made available for WIS 2.0 through MQTT for real-time access.



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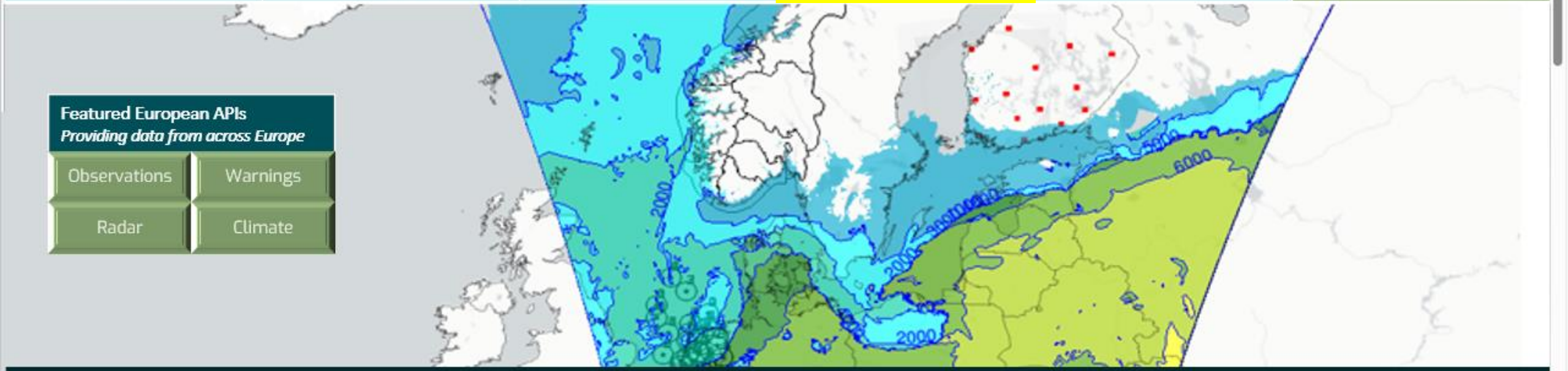

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Observations | Warnings | Radar | Climate

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EPOS
EMS

Contact us

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1180 Brussels, Belgium

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Homepage - Dev portal

https://www.Meteogate_Devportal.eu

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MeteoGate

DATA EXPLORER

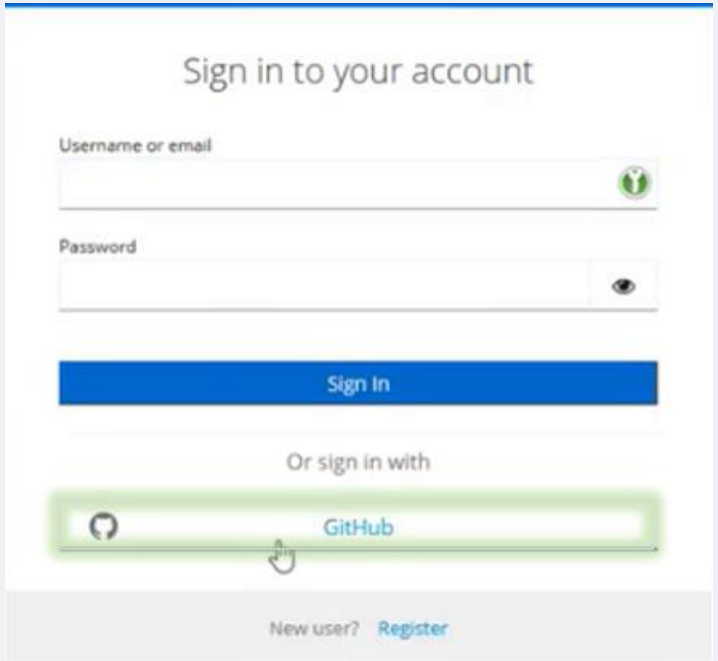
EUROPE APIs

ANNOUNCEMENTS

SUPPORT

Developer Portal

Secured with Keycloak



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EUMETNET
MeteoGate

DATA EXPLORER
EUROPE APIs
ANNOUNCEMENTS
SUPPORT

Developer Portal

Secured with Keycloak

Co-funded by the European Union

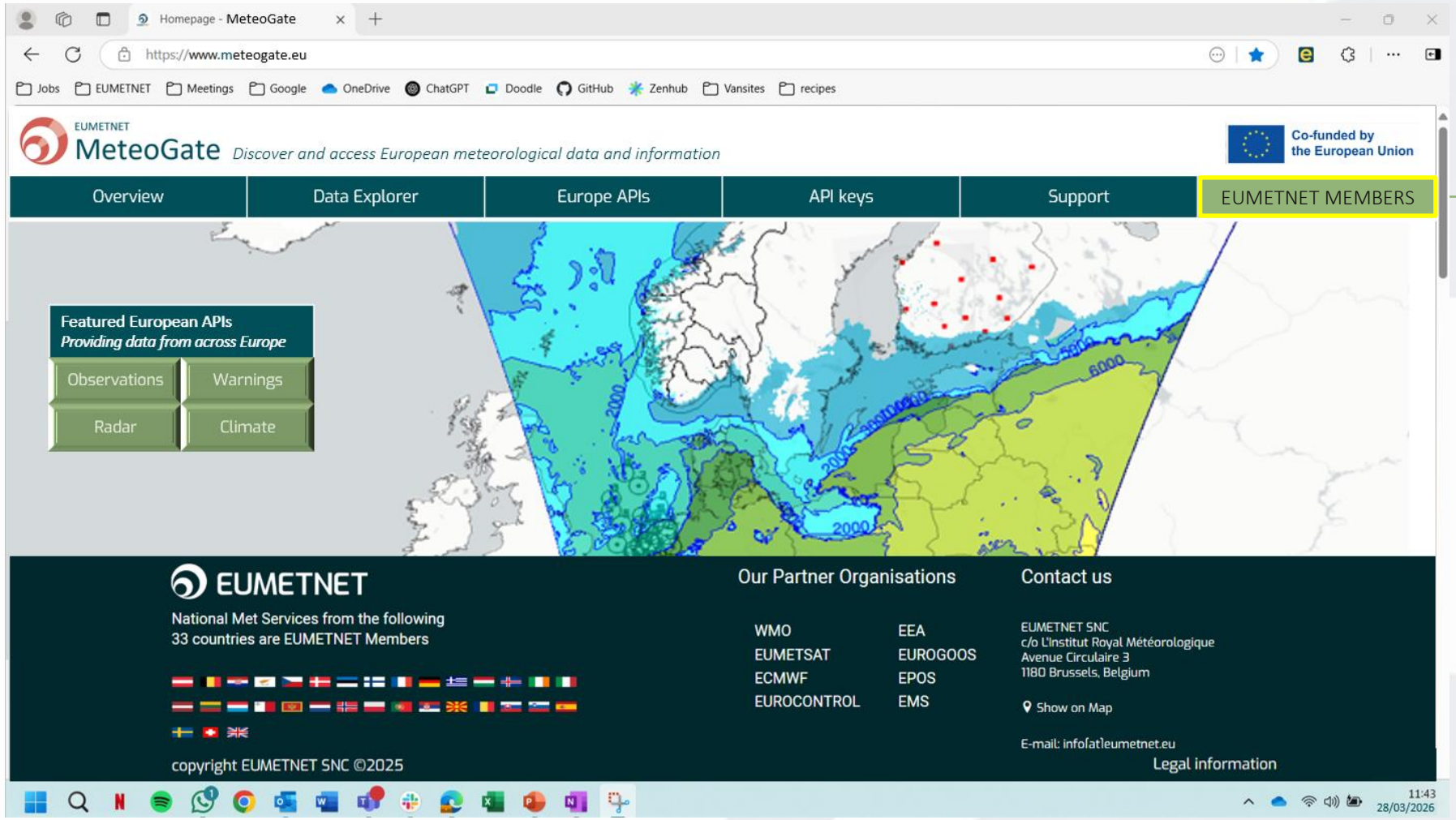
Get API key | Show routes | Delete API key | Logout

Info Pane

ApiKey: 41ed01dfb268d62fc9ea48a4796c44bf

The user experience

ONBOARDING TO MeteoGate



To be finalized during December 2025

Publishing Data

(How to publish data through MeteoGate; policy and technical guidance for incorporating APIs)

API Guidance

(Guidance for developing MeteoGate-compatible APIs (EDR) and datasets, including deployment options)

API Documentation

(RODEO WPs and others)

Technical Standards

(e.g. API, metadata)

The user experience

USING DATA

ADDING METEOGATE INTO ORGANISATION'S VALUE CHAINS

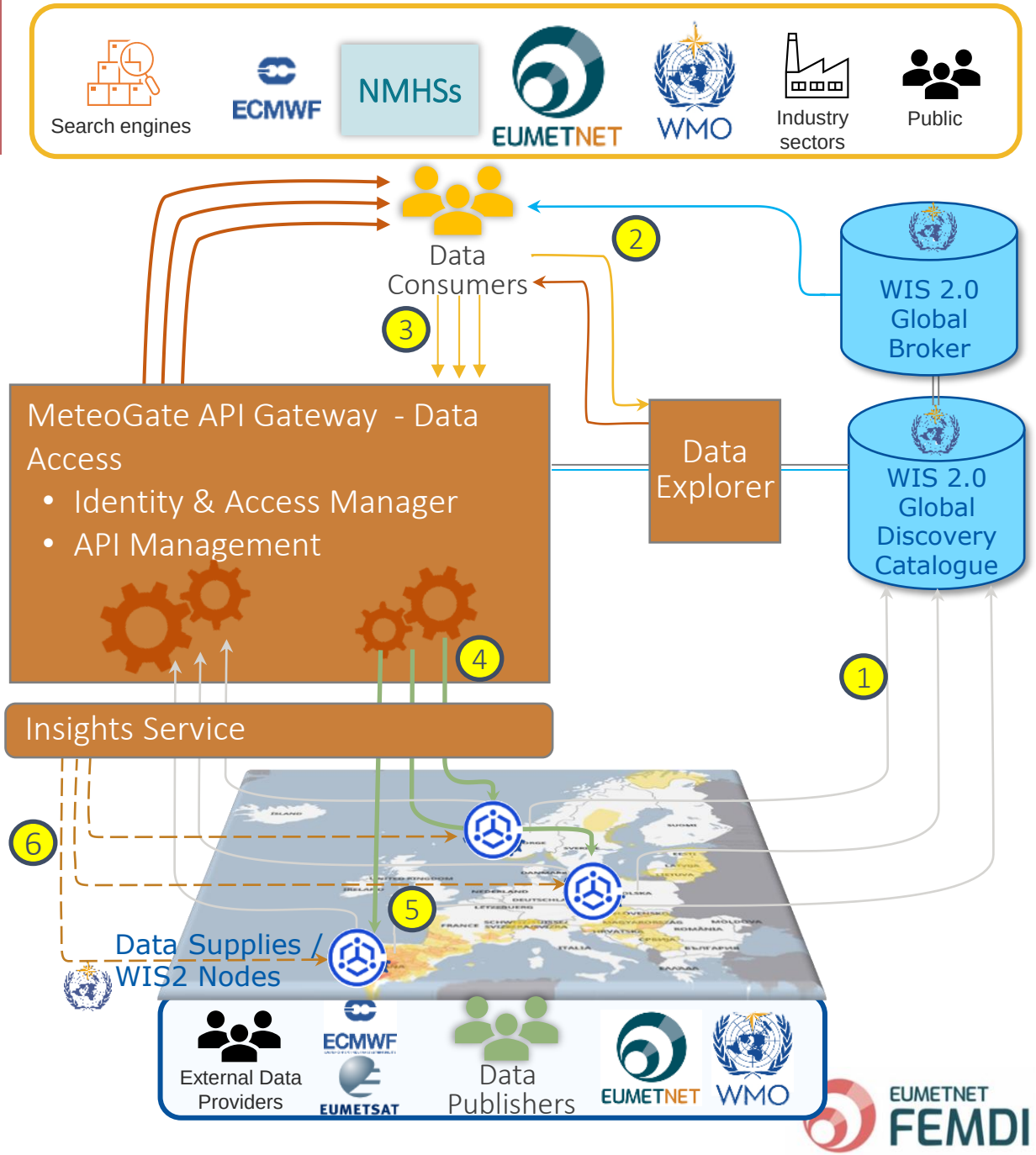
- Communication
- Operations
- External data services provision
- IT operations
- Research
- AI applications using MeteoGate data

  MeteoGate provides access to data that can be used for AI applications. As part of the RODEO project, we showcase 2 types of AI applications, both related to precipitation forecasting:

  - Training: The training dataset is based on the OPERA radar data. The aim is to provide easy access to a long time-series of high-resolution gridded observations over Europe. The data format is such that the dataset is ready for ingestion by AI algorithms. To involve the AI community, a benchmarking exercise of post-processing methods is led by RMI. Also, the OPERA dataset is made available as part of Anemoi, an initiative that favours the co-development of AI solutions across Met Services.
  - Evaluation of AI models: The evaluation dataset is based on climate data from station observations. Climate statistics are derived from historical records and used to properly define extreme events and compute meaningful scores. Jupyter Notebooks illustrate how to use this data for the verification of AI models by non-verification-experts.

MeteoGate ‘One-Stop Shop’

1. We publish our metadata to the **WMO WIS2.0 Global Discovery Catalogue**.
2. People use the **MeteoGate Data Explorer** to discover what is available; searching, browsing and previewing our data. They decide what they want.
   They get the URLs here and use these to set up routine access to data. They also use the URLs to subscribe for data updates from the **WIS 2.0 Global Broker.**
3. They submit requests for the data to the **MeteoGate API Gateway**. Alternatively, where Members want to allow direct data access, they can also access data directly from Members’ data services.
4. **MeteoGate API Gateway** lets us see who’s using our data, protect ourselves against overload, and prioritise users during high demand.
5. Our **MeteoGate Local components** process their requests and return the data.
6. We receive useful information on the use of our data and service.

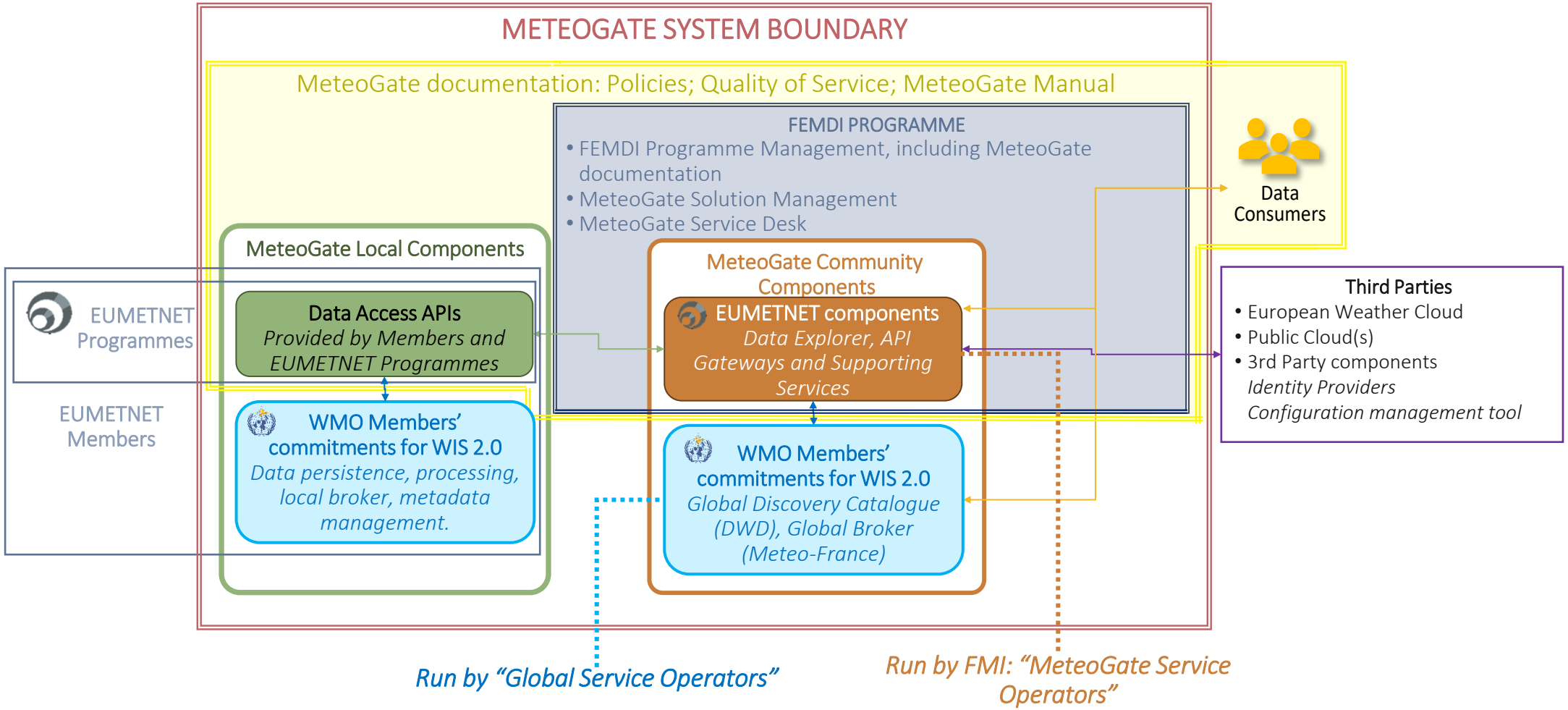


MeteoGate System & FEMDI Programme

FEDERATED EUROPEAN METEO-HYDROLOGICAL DATA INFRASTRUCTURE

EUMETNET MeteoGate

The one-stop shop making it easy to find and access authoritative Met data and products.



EUMETNET FEMDI

MeteoGate System & FEMDI Programme

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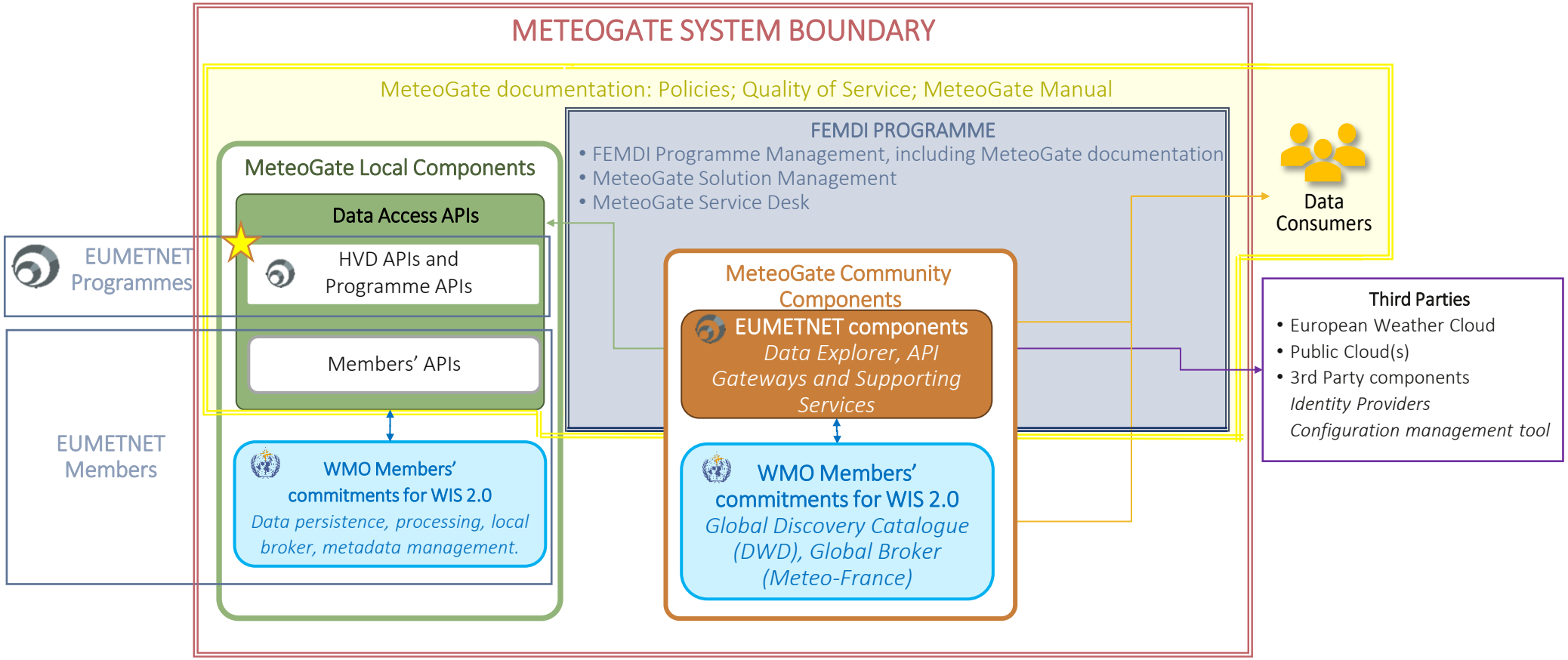

EUMETNET FEMDI

MeteoGate System & FEMDI Programme

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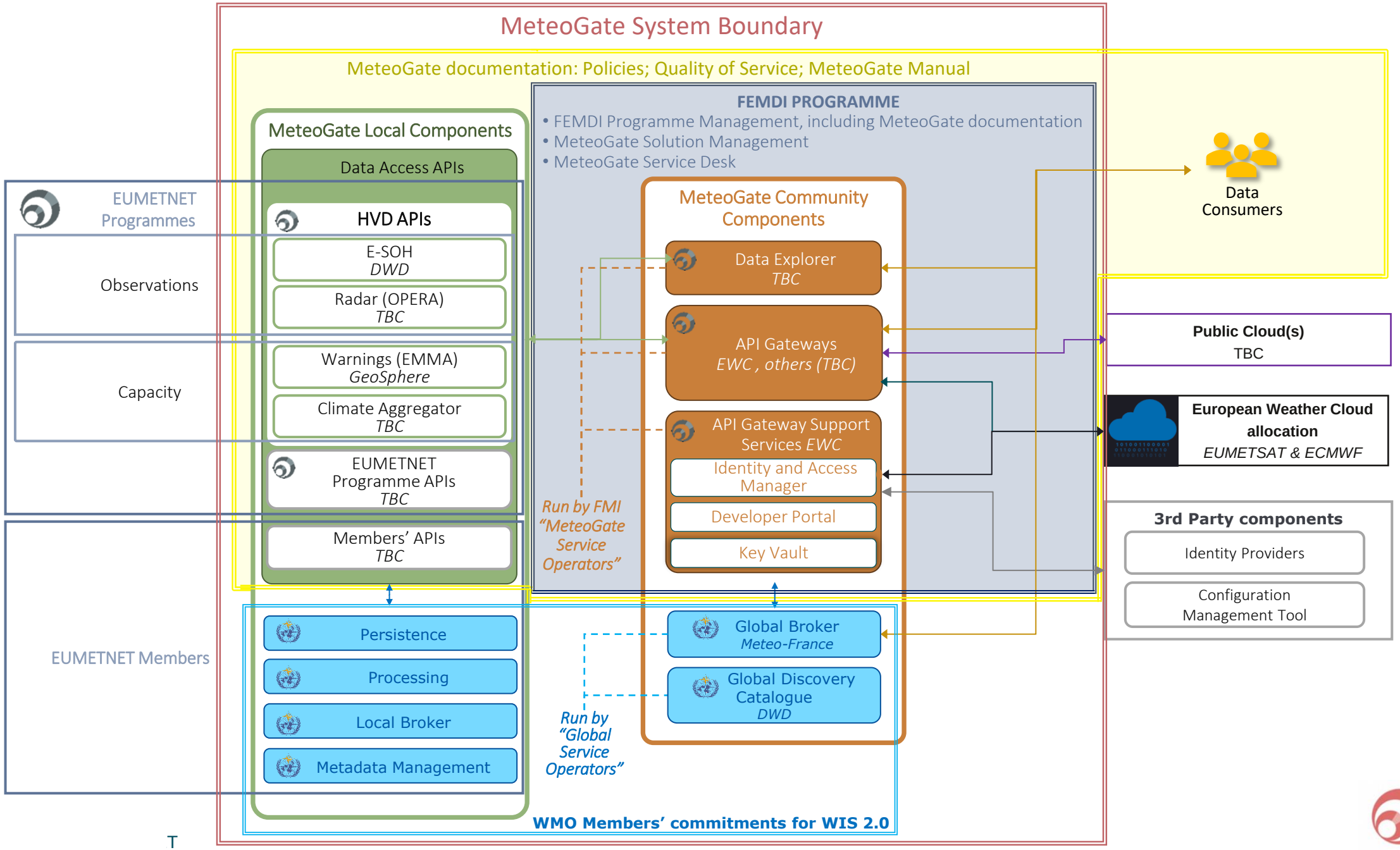

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MeteoGate

THE LAST WORD

METEOGATE:

- Builds on the foundation of WIS 2.0, leveraging the WIS2 Global Services – MeteoGate is *part* of WIS2!
- Adds:
  - Standardized interactive Web-services (APIs – notably OGC-API EDR) to query and access data; plus community-operated API-Management (MeteoGate Gateway)
  - Community-operated APIs for High-Value-Datasets (HVD): observations, climate, radar, warnings
  - Web-application to discover datasets and interact with data provided by API (Data Explorer)

RELEVANCE TO WMO RAVI MEMBERS?

- Data published through MeteoGate is all open (free and unrestricted use) – access to some data requires users to register
- Any data published to WIS2 is discoverable via the Data Explorer (but only data provided via the standardized APIs can be displayed)
- EUMETNET Members and Cooperating NMSs can on-board their observation, climate, radar and warning data to the community-operated APIs, and can on-board their own APIs to the MeteoGate Gateway

FOR MORE INFORMATION ABOUT ON-BOARDING DATA OR APIS TO FEMDI:

- Please get in touch with the EUMETNET FEMDI programme https://eumetnet.eu/data-access/federated-european-meteo-hydrological-data-infrastructure-femdi/
- Documentation and other resources will soon be available at https://meteogate.eu/

Questions?

EUMETNET