

MEDIA WORKSHOP
2026

JUNE, 18-19 | ITALY
ESA - ESRIN | FRASCATI

Understanding Earth from Space: Data, AI and Communication for Climate Adaptation



ORGANIZER

forumeteoclimat.com



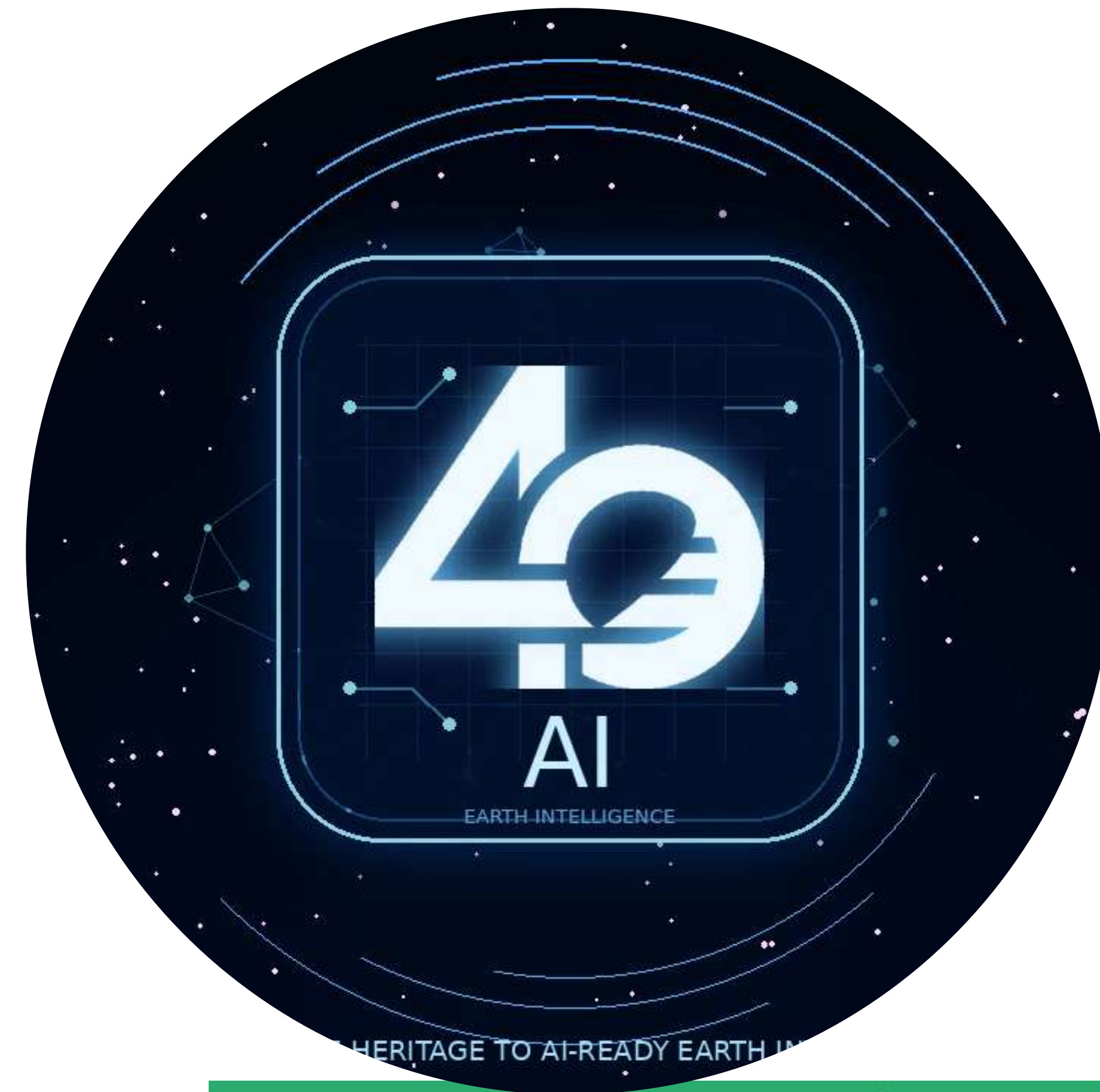
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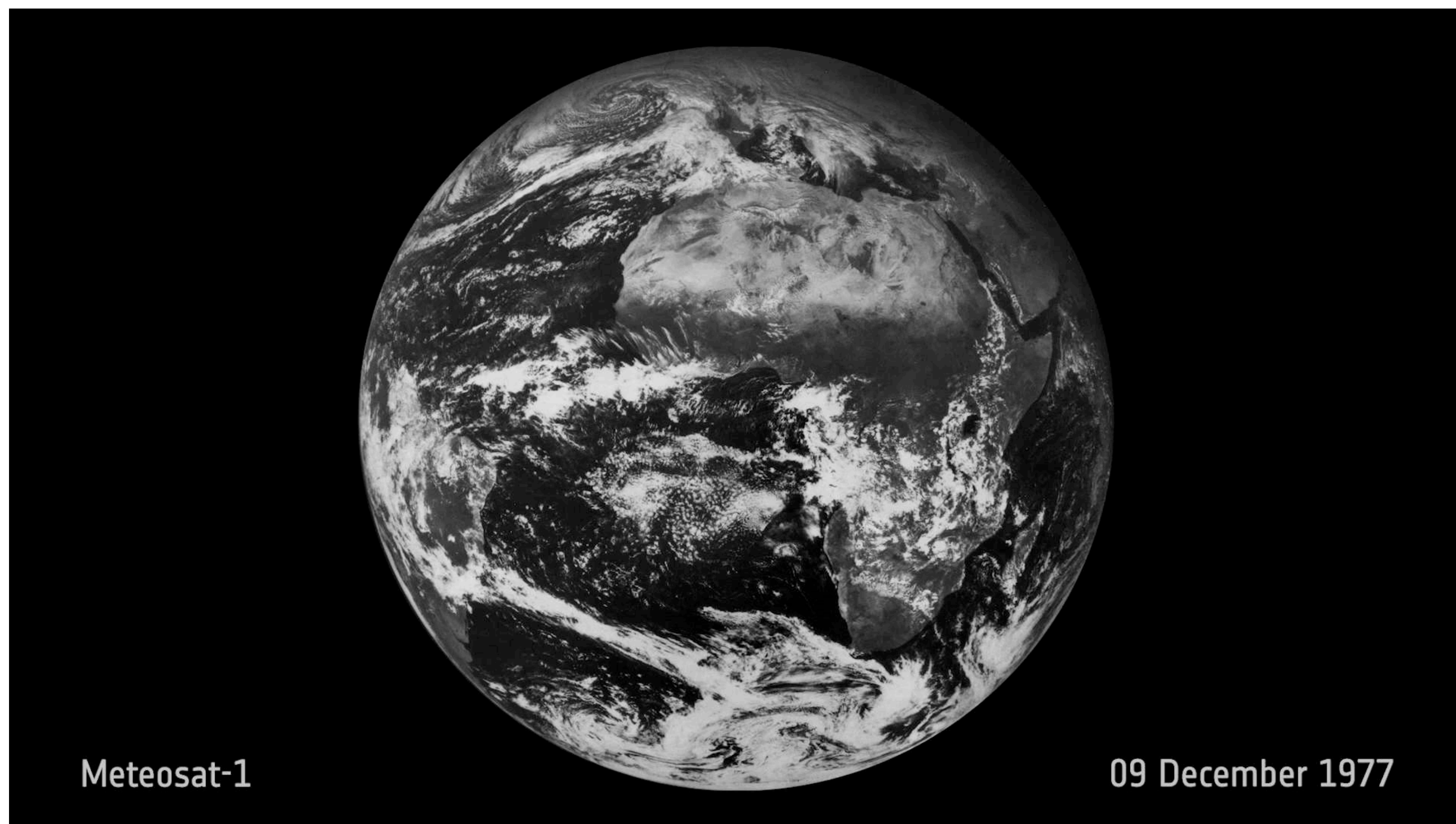
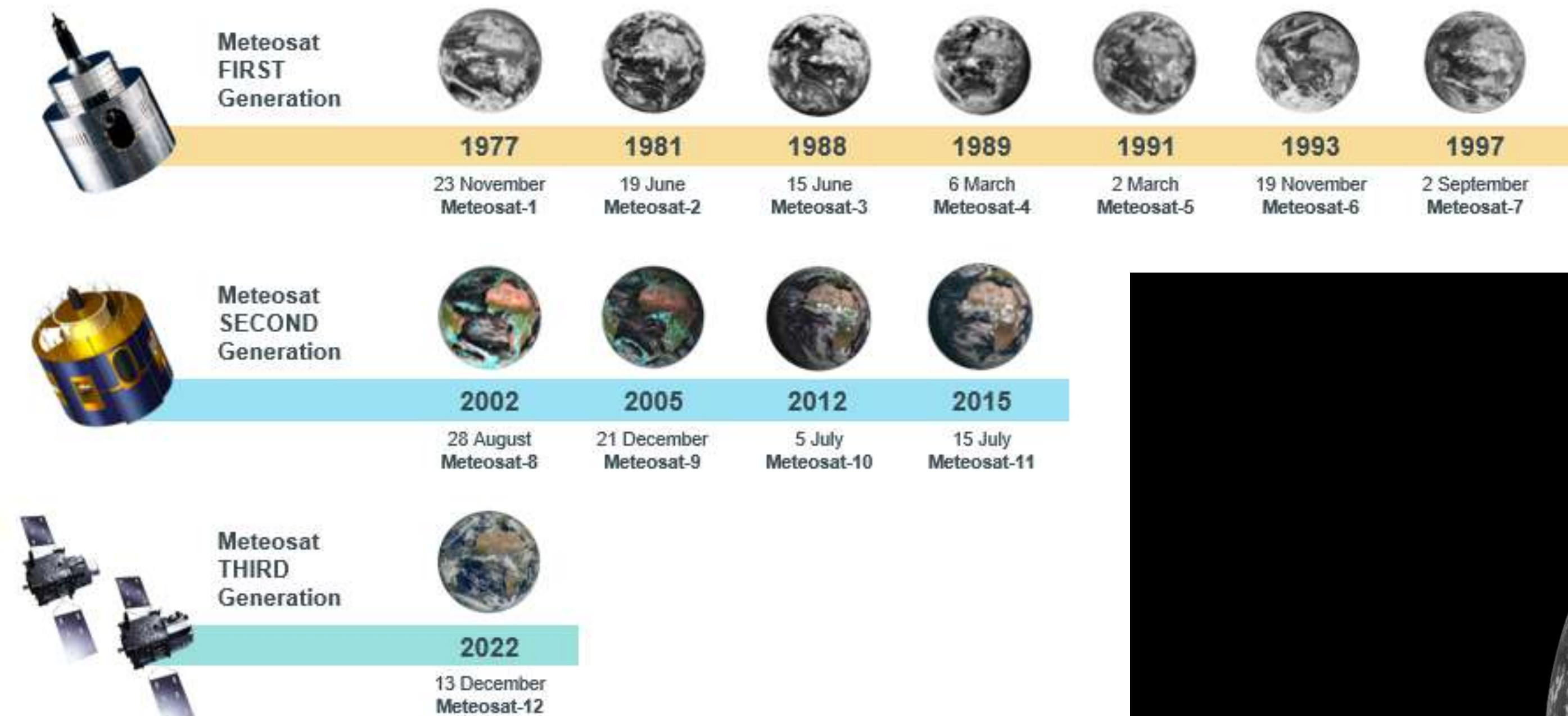
40th anniversary of innovation in Earth observation

Paolo Ruti, Chief Scientist - EUMETSAT



40+ years of Meteosat

Trusted in Space. Essential on Earth.



From 1946 to 1986 , until 2020 and +

Trusted in Space. Essential on Earth.

2008-17 – Seamless Earth system prediction

1979 – First ECMWF weather forecast

1977 – The Meteosat series began

1960-63 – TIROS-1 first dedicated weather-satellite view of cloud systems; WMO approved the World Weather Watch, Global Observing System

1950 - The first successful numerical weather forecast was carried out on ENIAC

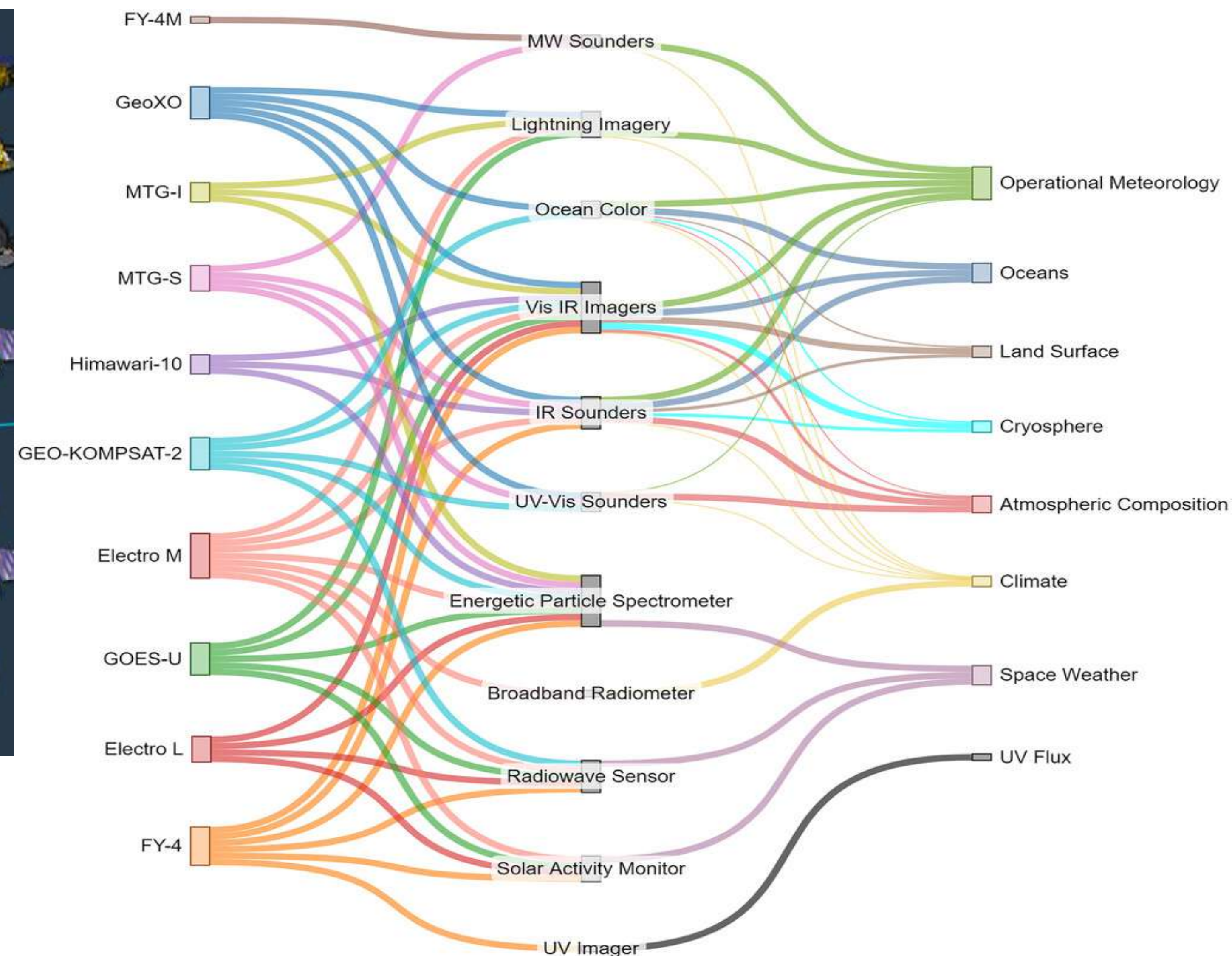
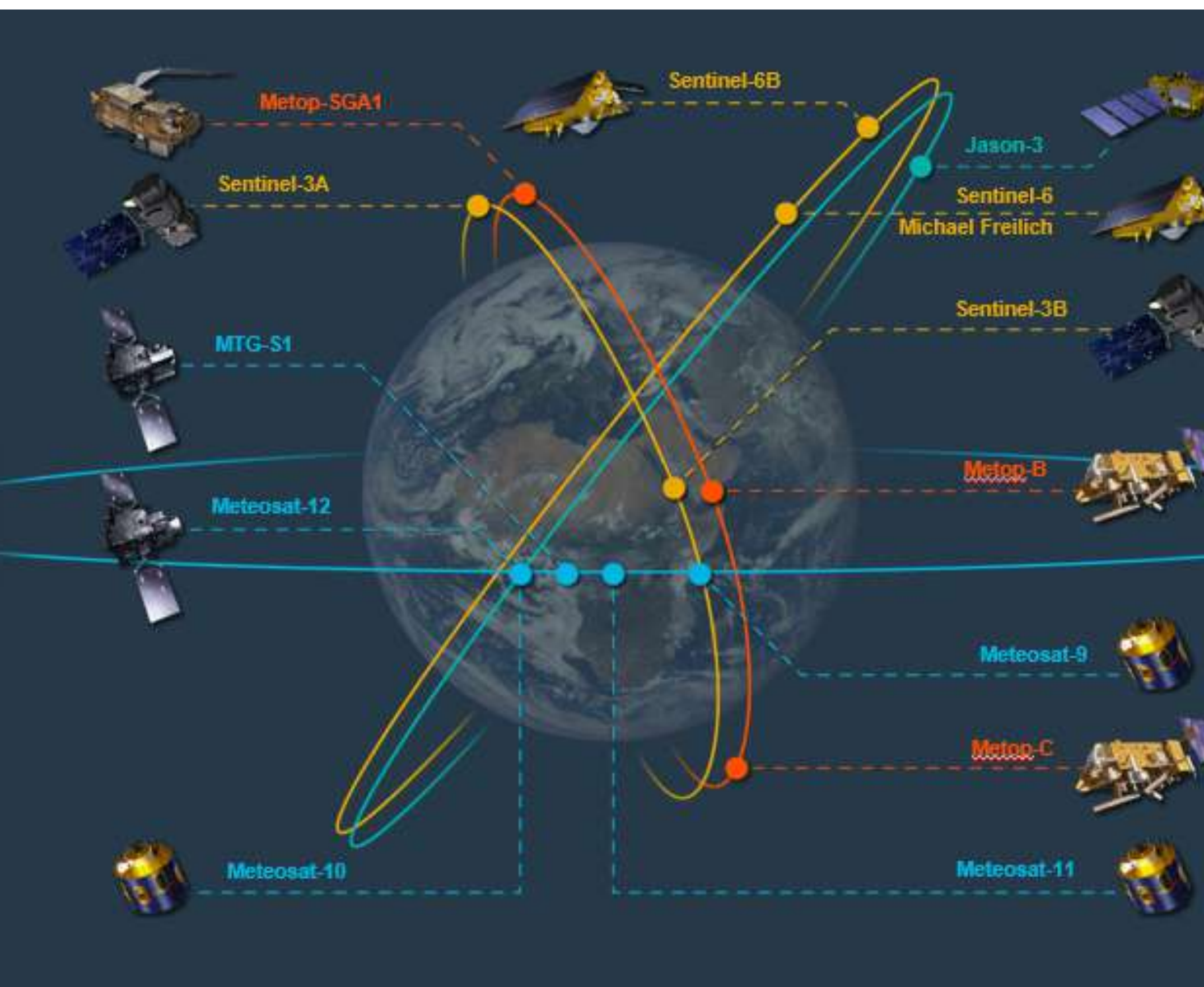
1946, von Neumann's Meteorology Project at the Institute for Advanced Study - Charney's contribution



2022 — First high-resolution AI global models

2023 — Breakthrough deterministic AI forecasts.

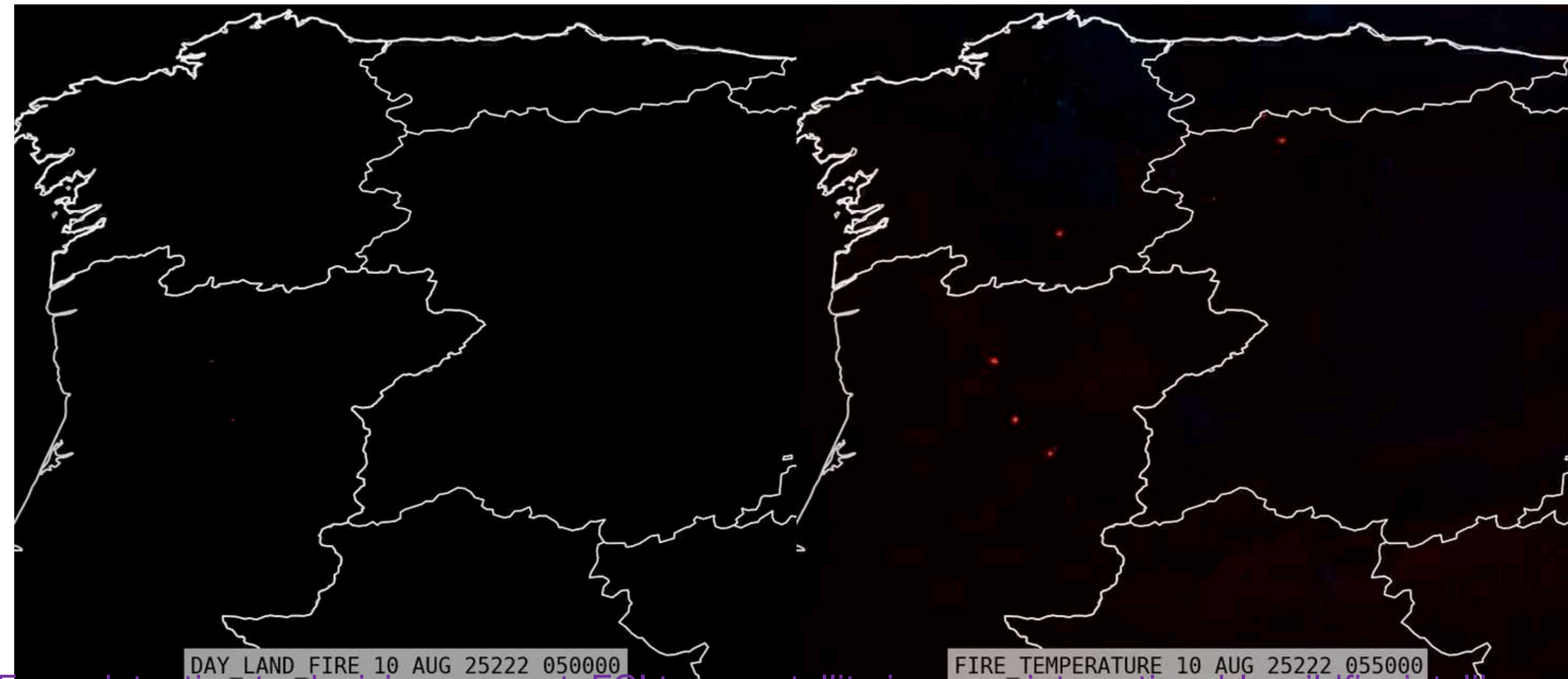
2025 — Operationalisation and Earth-system foundation models



From: Shenolikar J, Ruti PM, Lee D, et al. The State of Earth Observing System Today: Updates Compiled from Recent EUMETSAT Meteorological Satellite Conferences. *Bull. Amer. Meteor. Soc.*. 2025;106(2):E217-E241. doi:10.1175/BAMS-D-23-0261.1

FCI: wildfire assessment at the speed of fire

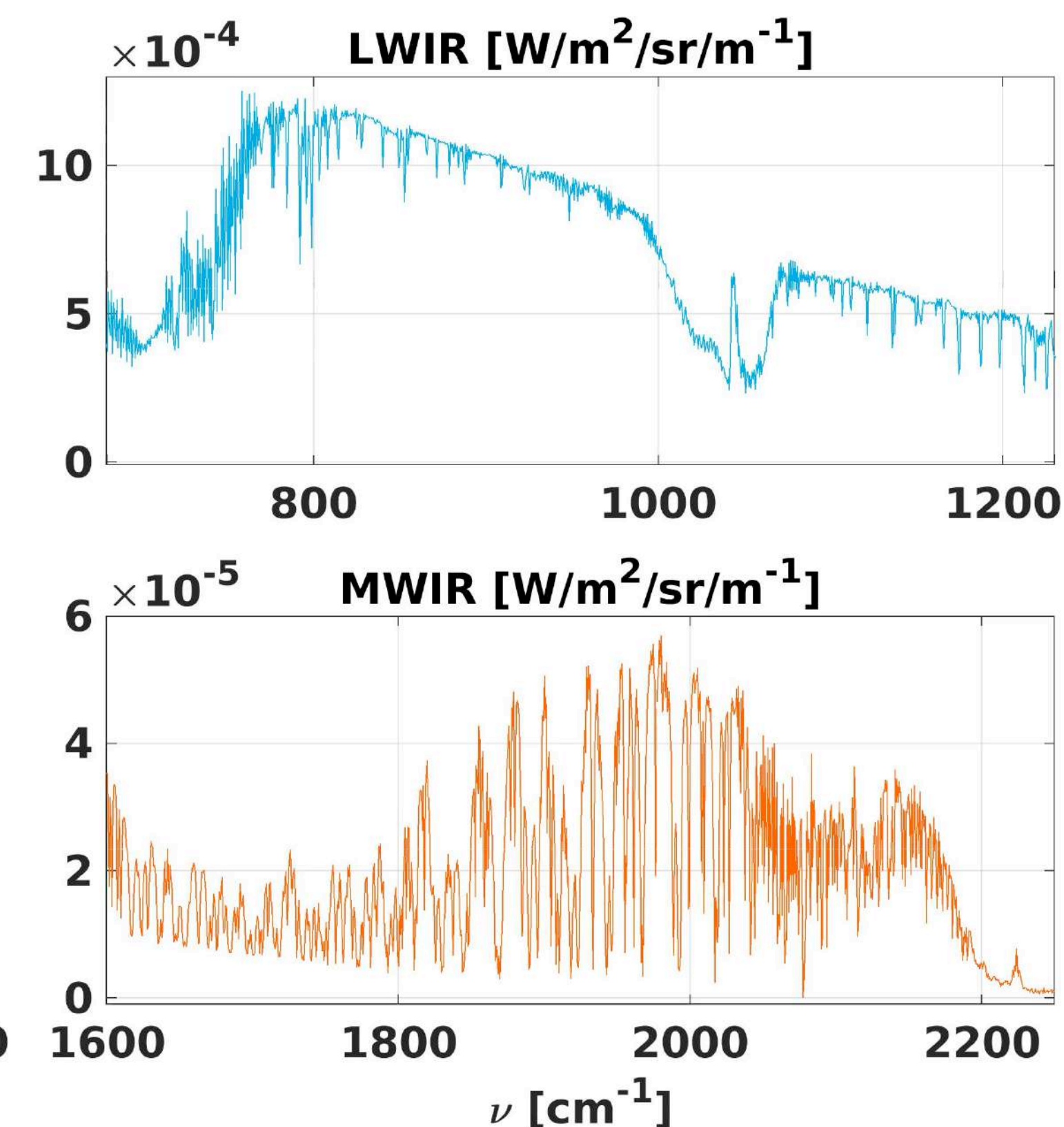
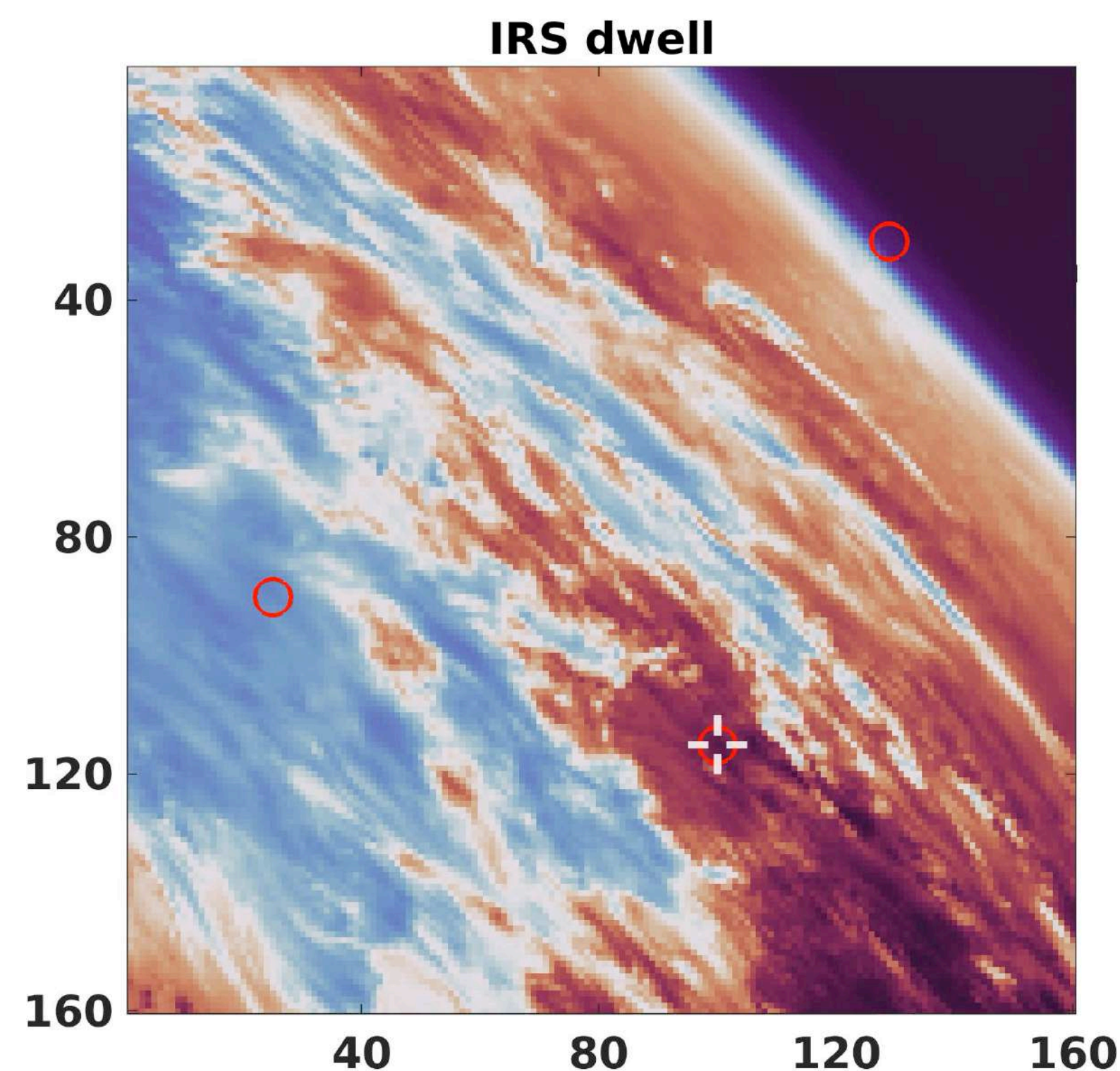
- **2025: Europe's worst wildfire season in 20 years**
- Meteosat-12's **Flexible Combined Imager** detected and monitored fires across Spain, Portugal, Montenegro and beyond
- **Day Land Fire RGB** shows where fires are burning
- **Fire Temperature RGB** shows wildfire intensity
- **10-minute observations** reveal fast-moving fire fronts, smoke plumes and sudden intensification
- This helps emergency services prioritise the most active fires and track how conditions evolve



From detection to decision support: FCI turns satellite imagery into actionable wildfire intelligence.

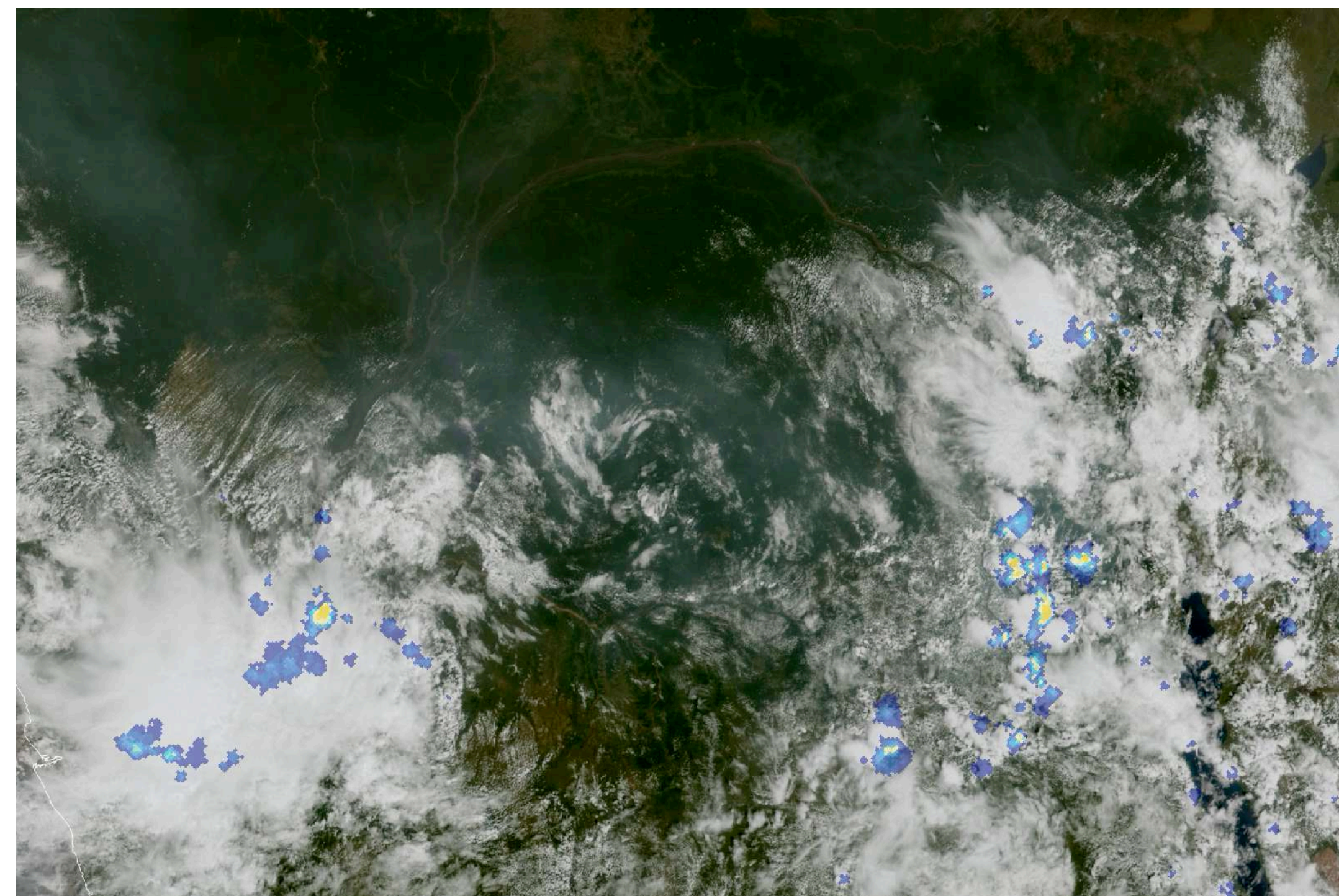
Inside every pixel

- Hyperspectral instrument capturing **1,953 infrared channels**
- Each pixel contains a full **spectral signature**
- Reveals temperature, moisture and atmospheric composition
- This “dwell” scan captures one Earth area near the limb
- Enables a richer, more detailed view of the atmosphere for forecasting



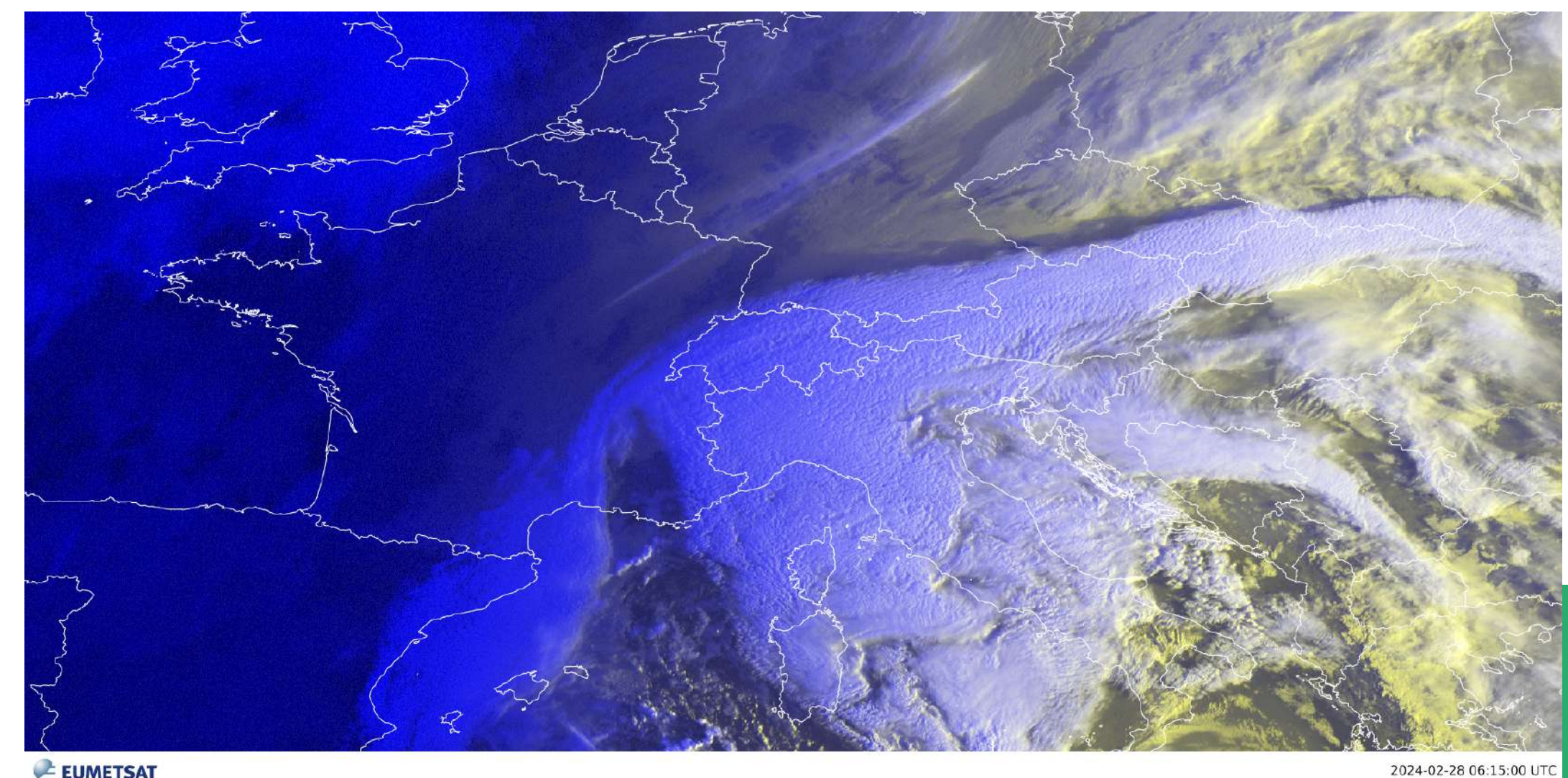
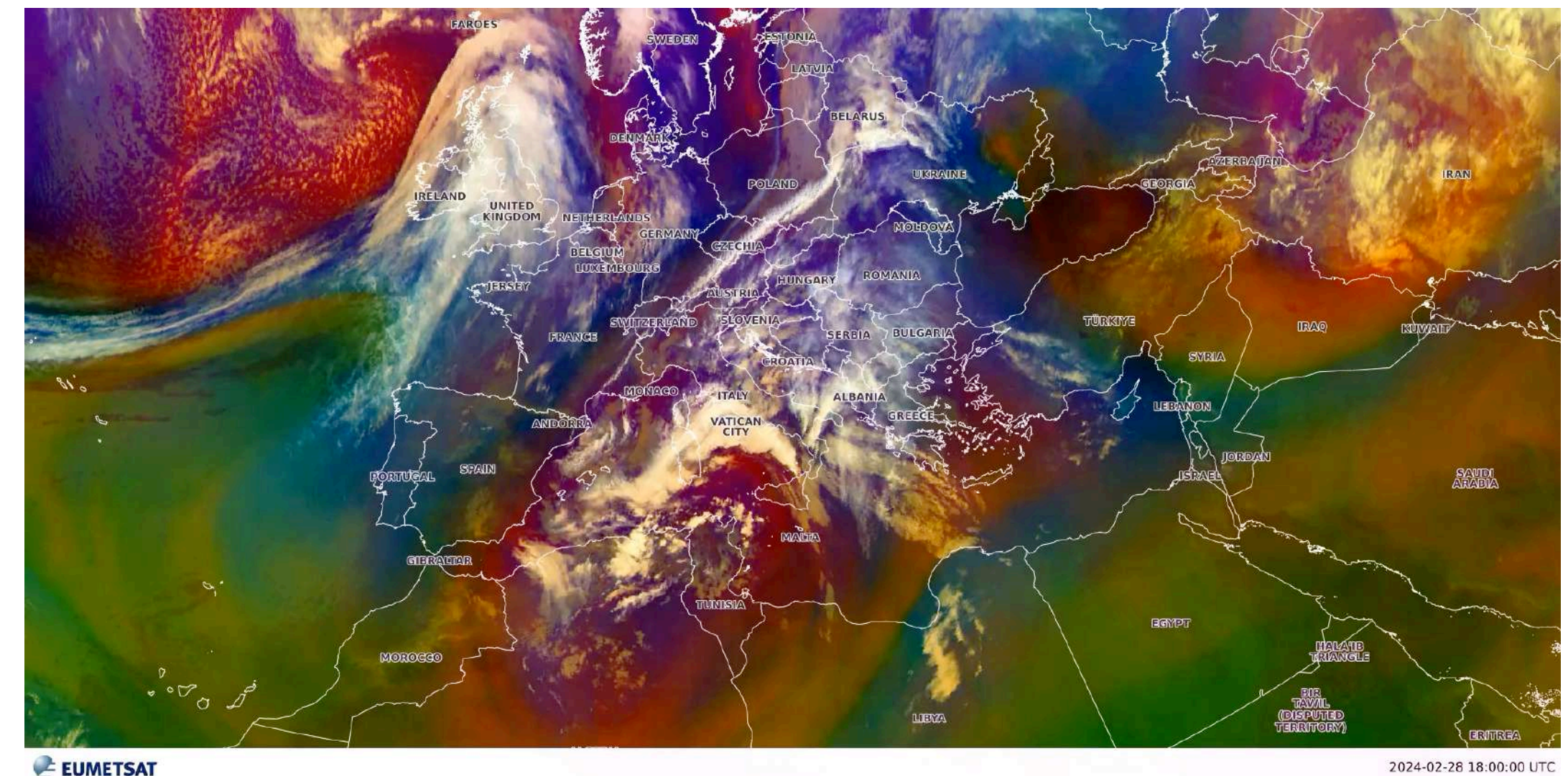
When hours matter: nowcasting floods in Africa

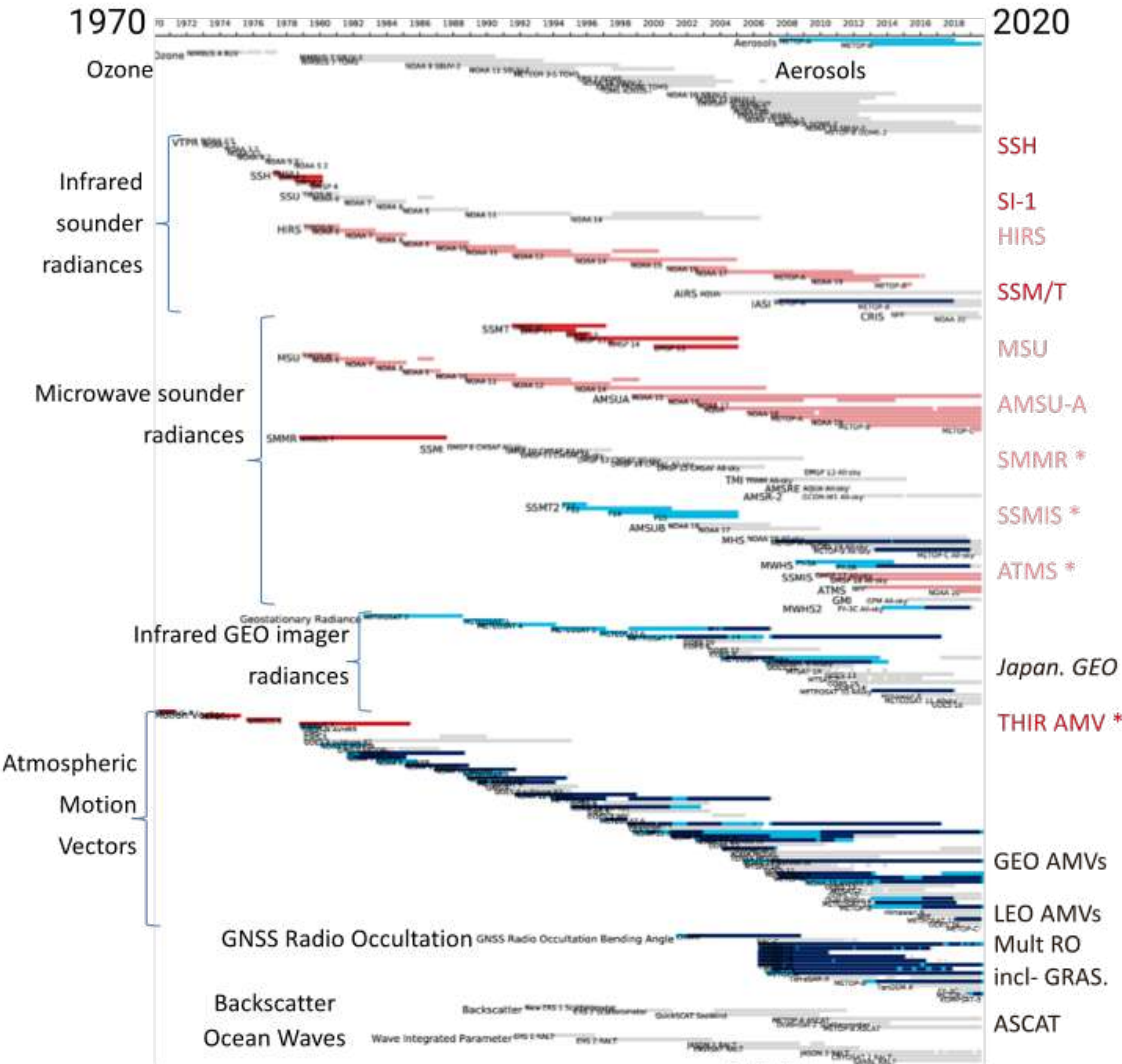
- MTG reveals fine-scale storm clouds
- “Popcorn” clouds signal rapid storm growth
- Severe storms may follow within the hour
- Lightning Imager tracks storm intensification
- First geostationary lightning data over Africa



From North Africa to Europe: Measuring dust transport across the Mediterranean

- Spinning Enhanced Visible and Infrared Imager on Meteosat-11 reveals the cyclone, the dust plume and how it evolves over time
- FCI on Meteosat-12 will improve dust monitoring with:
 - Higher resolution (1 km / 500 m)
 - More spectral channels
 - Greater sensitivity
 - Full-disc coverage every 10 minutes
- This is vital for tracking air quality events, visibility hazards and major dust storms such as haboobs

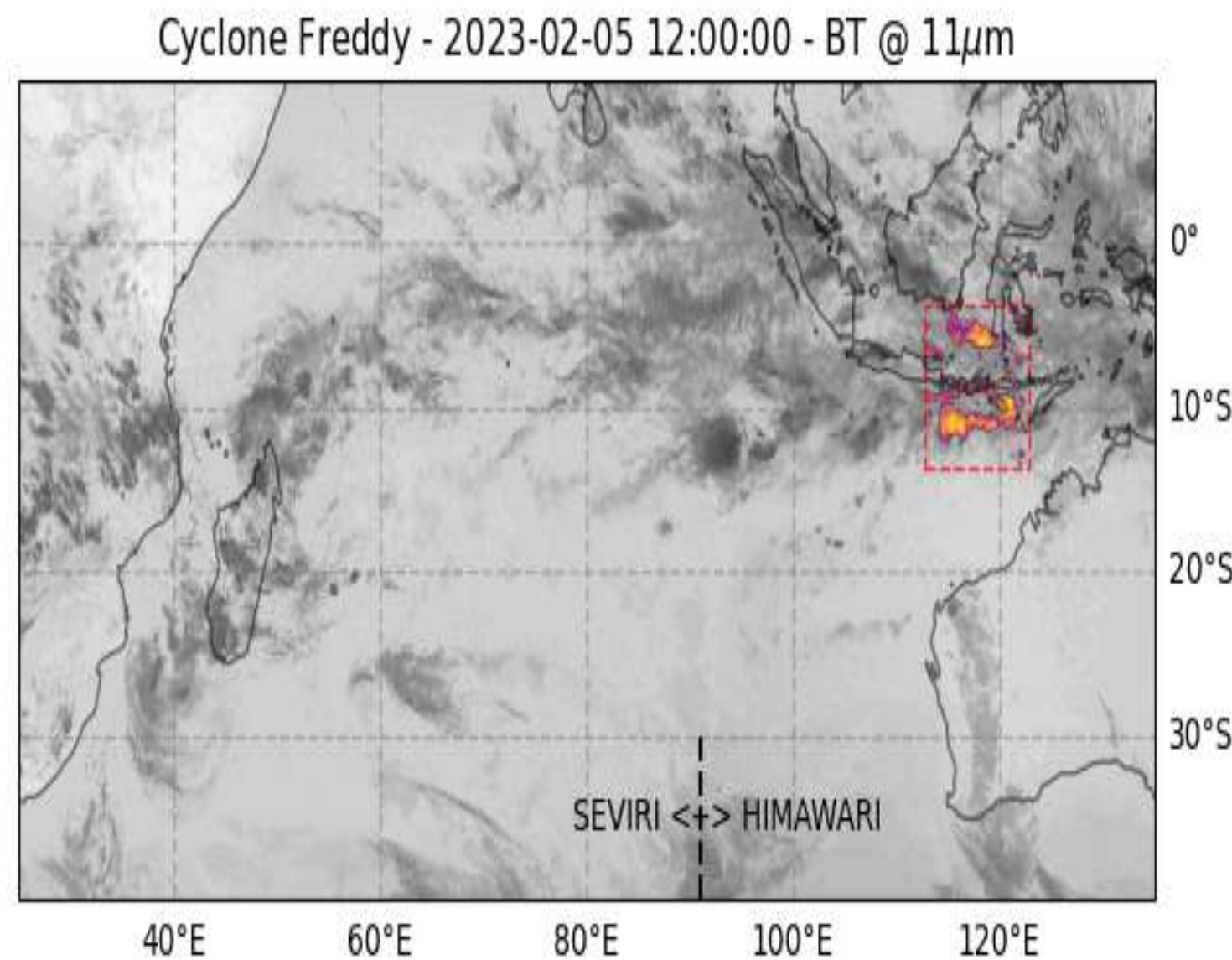




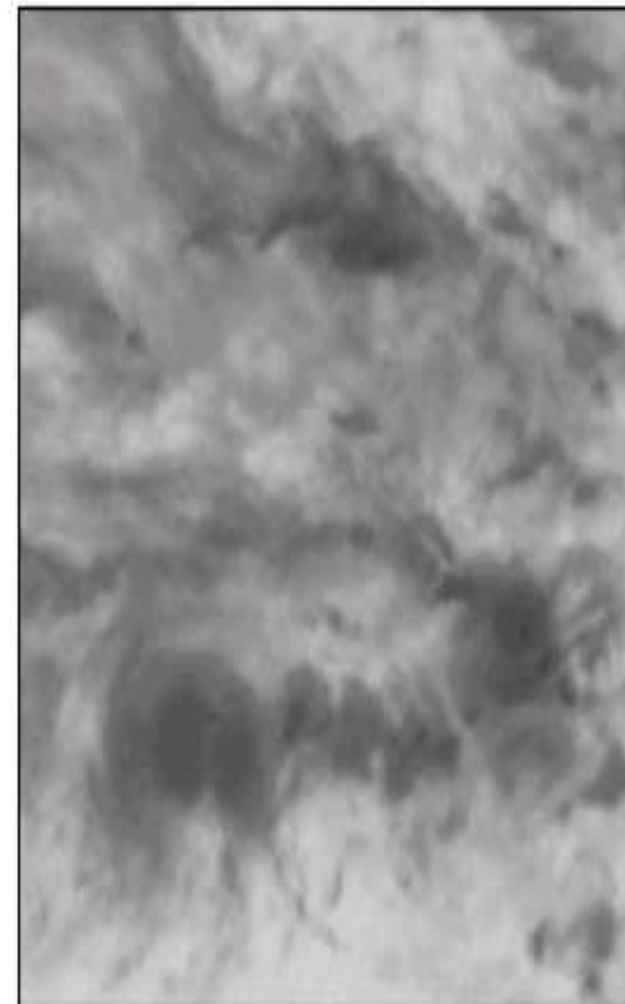
EUMETSAT contribution to ERA5

- Machine learning models are at best as good as their training data
- Training data must be 1) good quality 2) long-enough to contain sufficient variation 3) consistent and respective to the data used in inference phase
- For satellite data, these requirements are best fulfilled with climate data records

The GEORing



Zoom @ (117.79°E, 8.68°S)



- The raw data are available from EUMETSAT, NOAA, and JMA archives, each having their own format, quality information, calibration, navigation
- GEO FCDR (Geostationary Fundamental Climate Data Record): the raw data is processed and quality controlled. The data are recalibrated using reference measurements
- L1G-sat data are remapped to a fixed grid

- Expand European observation capabilities
 - A high-quality data backbone is a critical baseline for today's and tomorrow's resilience and adaptability
- AI as a Game Changer
 - AI introduces a flexible paradigm for application development in several value chains, integrating high- and intermediate-quality data, and exploiting non-conventional sources.
 - Continuity, stability, and quality of data remain central — AI should enhance EO satellite exploitation considering physical explainability.