




Transition to MTG-II Data at the Estonian Environment Agency: First Results and Discoveries

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MSG & MTG SATELLITES

Data received from geostationary satellites are important in the daily work of weather forecasters: nowcasting and early warnings of high impact weather like thunderstorms, lightning, fog, hail, strong winds etc.

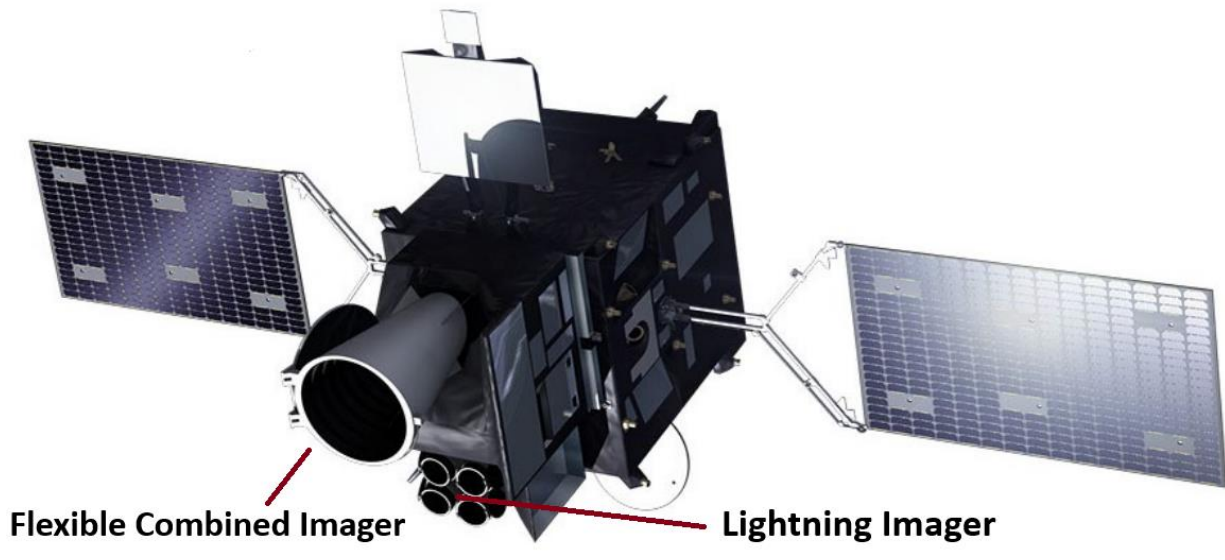
MEASUREMENTS OVER EUROPE

	MSG 	MSG 	MTG 
SERVICE	MET-10 0° FES	MET-11 9.5° RSS	MET-12 0° FDSS
MEASUREMENT	15 min	5 min	10 min
RESOLUTION	1/3 km	1/3 km	0.5/1/2 km

METEOSAT-12 INSTRUMENTS

Flexible Combined Imager (FCI)

Delivers high-resolution spectral and temporal data (up to 500 m), provides detailed information about clouds, aerosols, and ground properties.



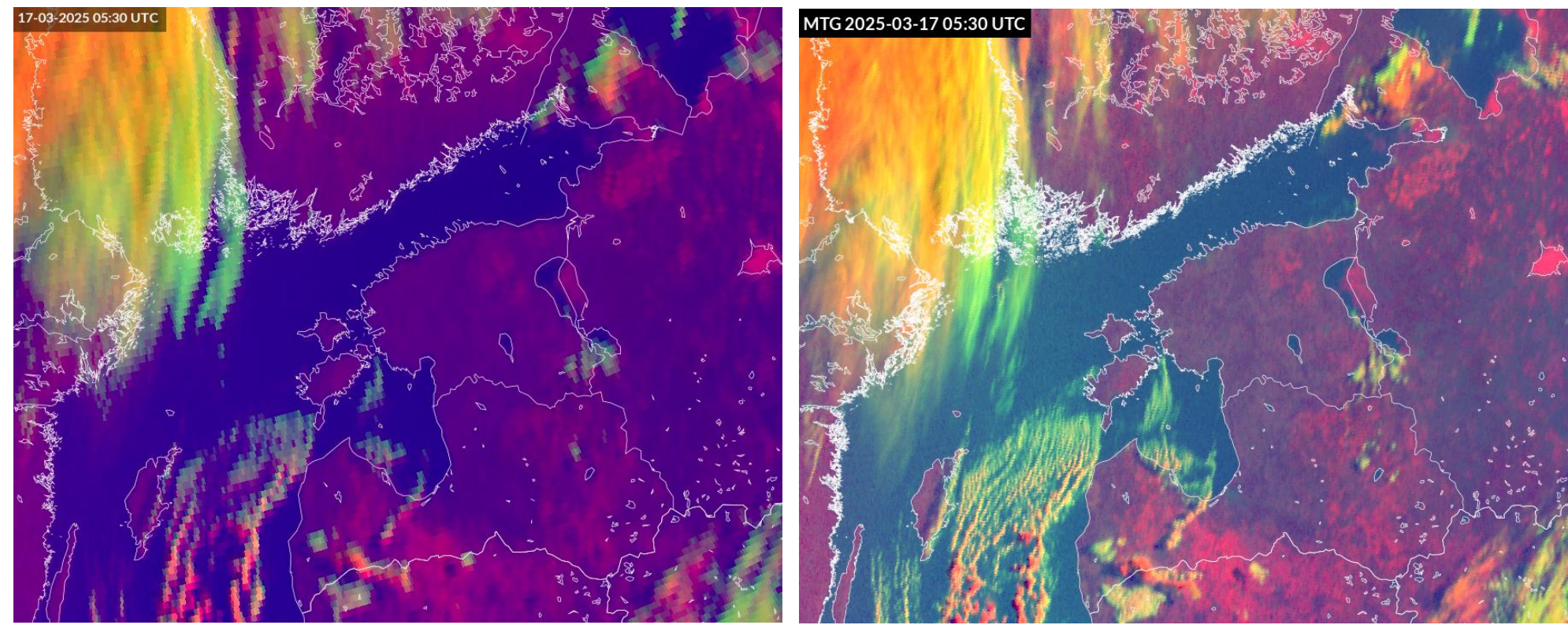
Lightning Imager (LI)

Offers real-time detection of lightning across Europe, Africa, and the Atlantic, including cloud-to-ground, cloud-to-cloud, and intra-cloud flashes.

Both instruments provide enhanced observations that help forecasters detect the early stages of severe weather development, improve storm monitoring, and issue more accurate short-term forecasts.

MSG SEVIRI

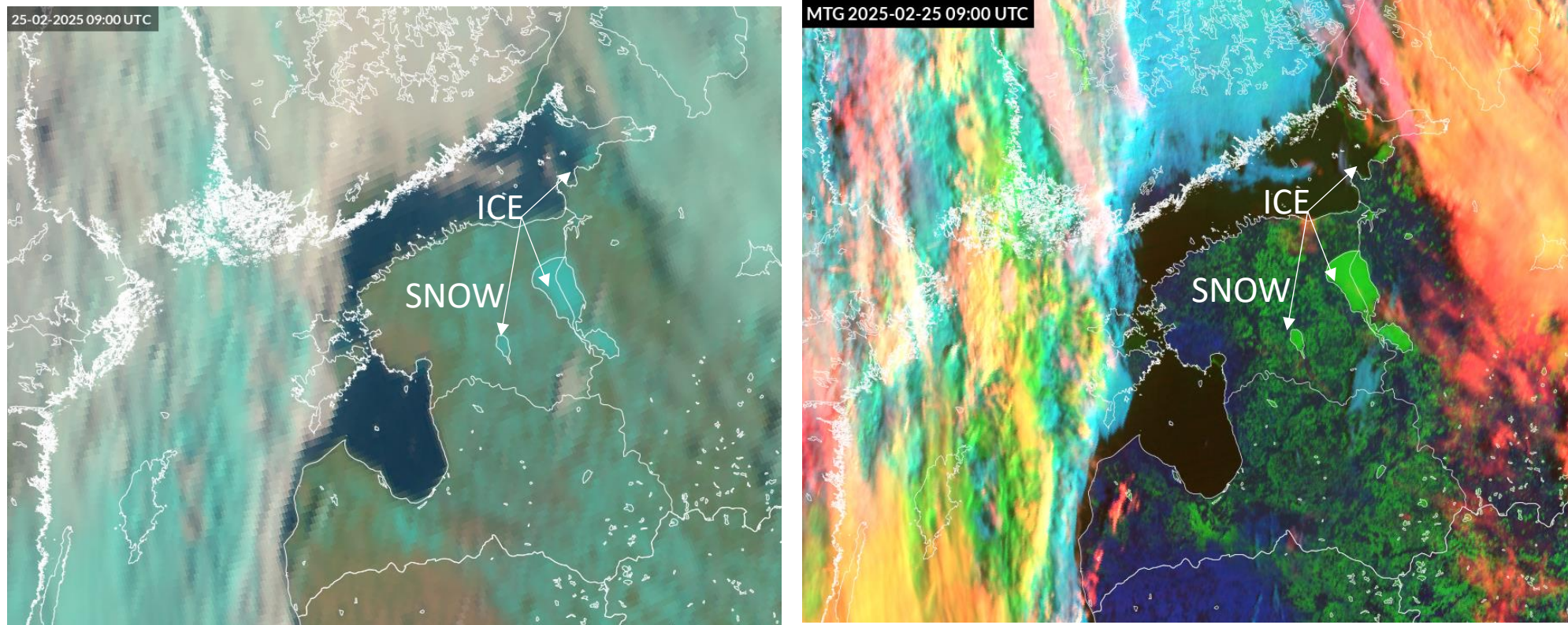
MTG FCI



Day Microphysics RGB

MTG supports the continuation of MSG measurements with new imaging & sounding instruments and improved resolution.

MET-12 became prime in June 2025

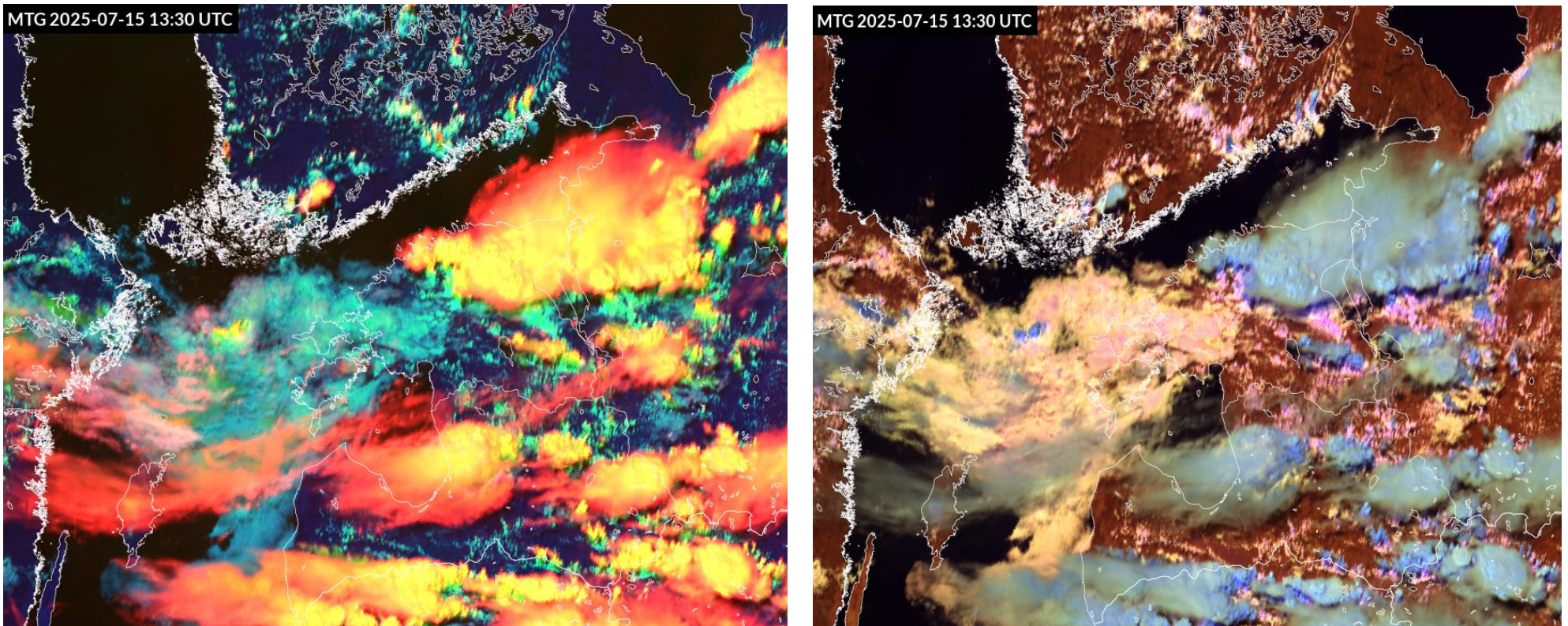


Natural Colours RGB

Cloud Type RGB

MTG new channels – new RGB composites enhance monitoring of clouds & land surface features.

NEW RGB COMPOSITES



Cloud Type RGB

Cloud Phase RGB

RGB imagery, combined with radar data and NWCSAF products, improves analysis & early warnings of severe weather.

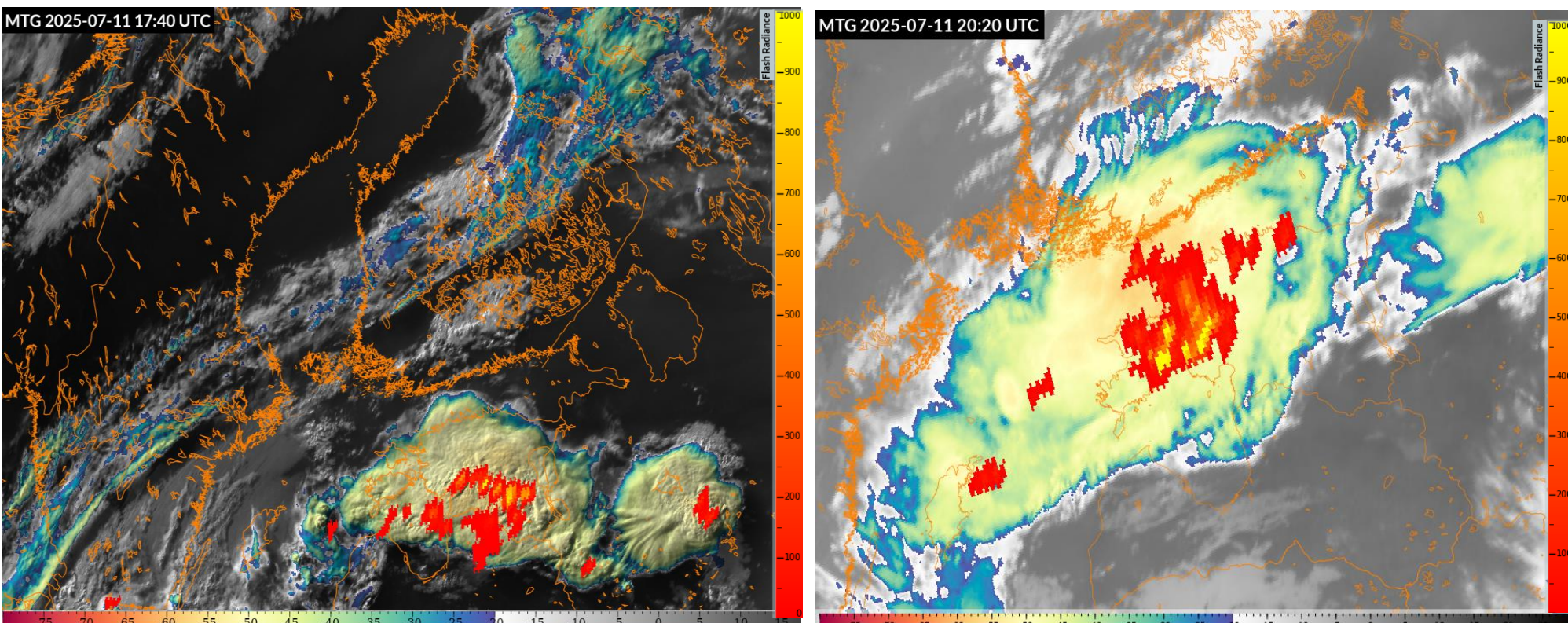
DATA RECEPTION



New **2.4 m satellite antennas** have been installed at different locations to minimize weather impact on data reception.

Setup EUMETCast Satellite (HVS-1,-2) + EUMETCast Terrestrial. Reception is optimized by **PyTROLL Trollmoves**.

MTG FCI & LI DATA COMBINATION



Powerful thunderstorm in Estonia


Sandwich RGB + LI L2 AFR 10-min Accumulated Flash Radiances
Daytime imagery using HRSI VIS 0.6 µm highlights 3D cloud structures

DATA PROCESSING

MTG FCI & LI data are processed operationally using **PyTROLL Trollflow2** Docker containers running on separate VMs.

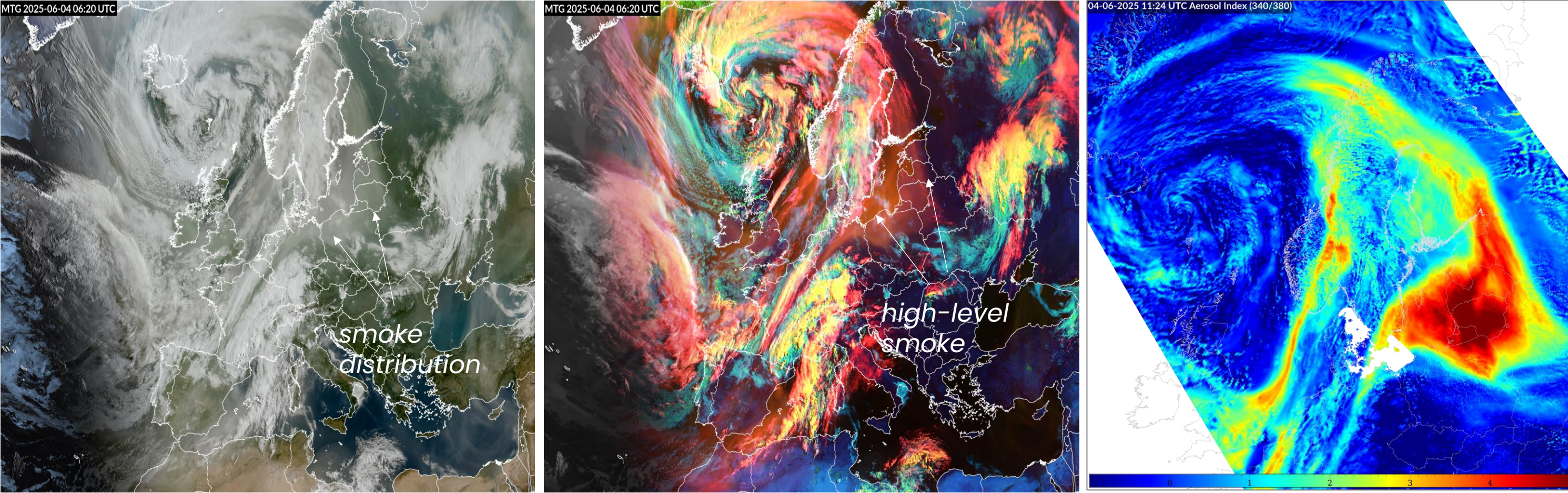
MTG satellite imagery (FCI & LI) has been available to weather forecasters via the internal web portal **since March 2025**.

Forecaster feedback has been collected to help define **MTG FCI Level 2** products for near-future processing.

RESOURCES		Dev VM & Live VM			 MTG FCI & LI data processing on separate Virtual Machines (VM)
CPU / RAM		8 cores / 15 GiB			
Running containers		MTG FCI & MTG LI			
Generated images	Europe 10 FCI RGB 2 LI L2 AFR	Baltic region 10 FCI RGB 2 LI L2 AFR	Estonia 12 FCI RGB 1 LI L2 AFR		

DISCOVERING MTG DATA – CASE STUDIES

Canadian wildfire smoke over Europe, 04.06.2025

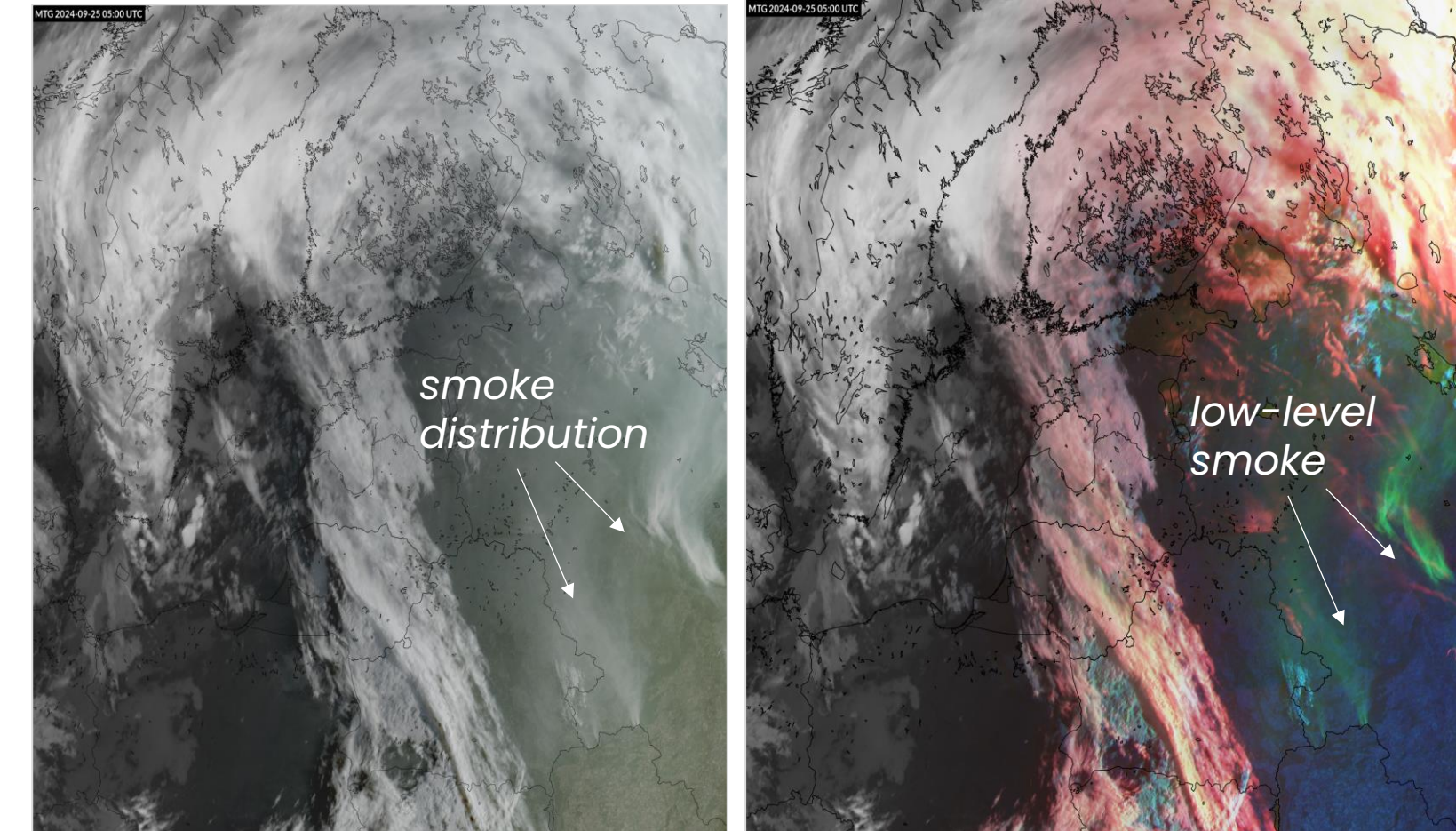


Geo Colour RGB

Cloud Type RGB

Sentinel-5P AAI

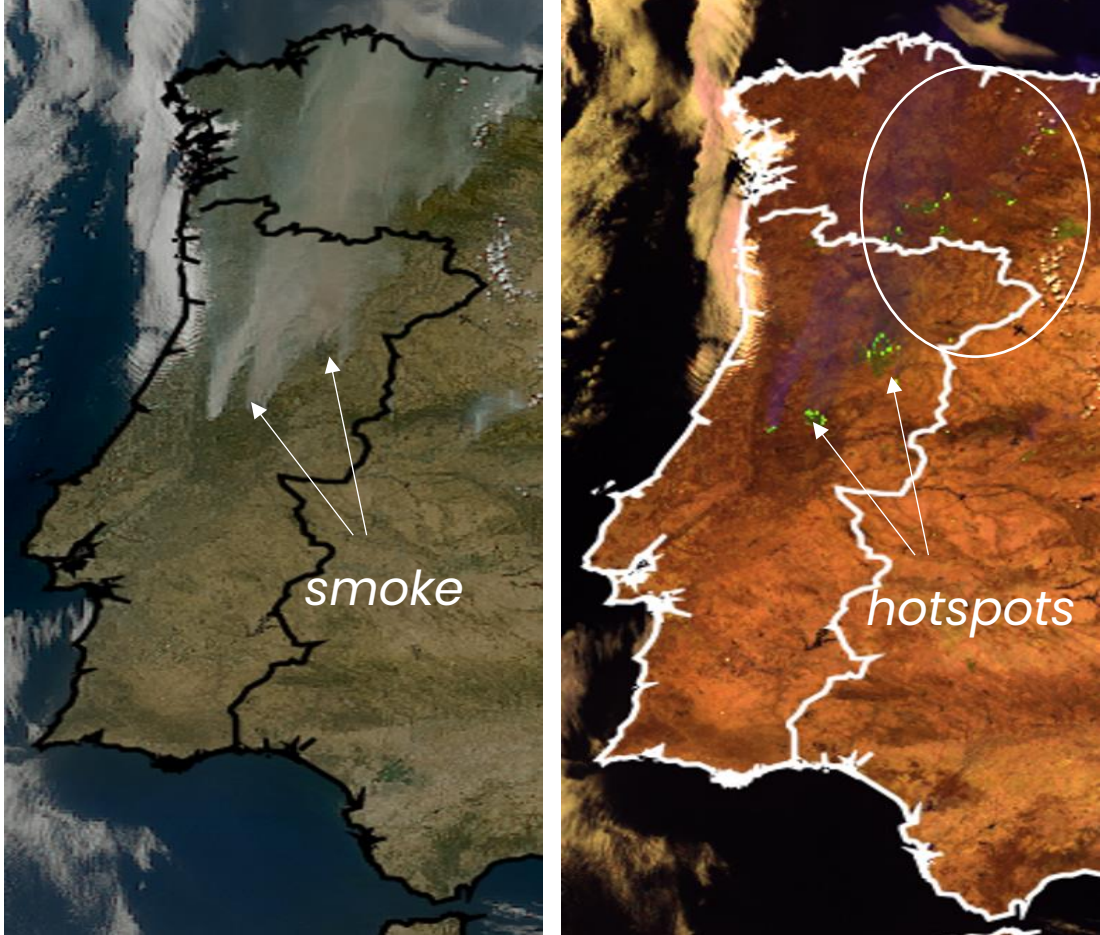
Smoke distribution from Eastern Europe, 25.09.2024



True Colour RGB

Cloud Type RGB

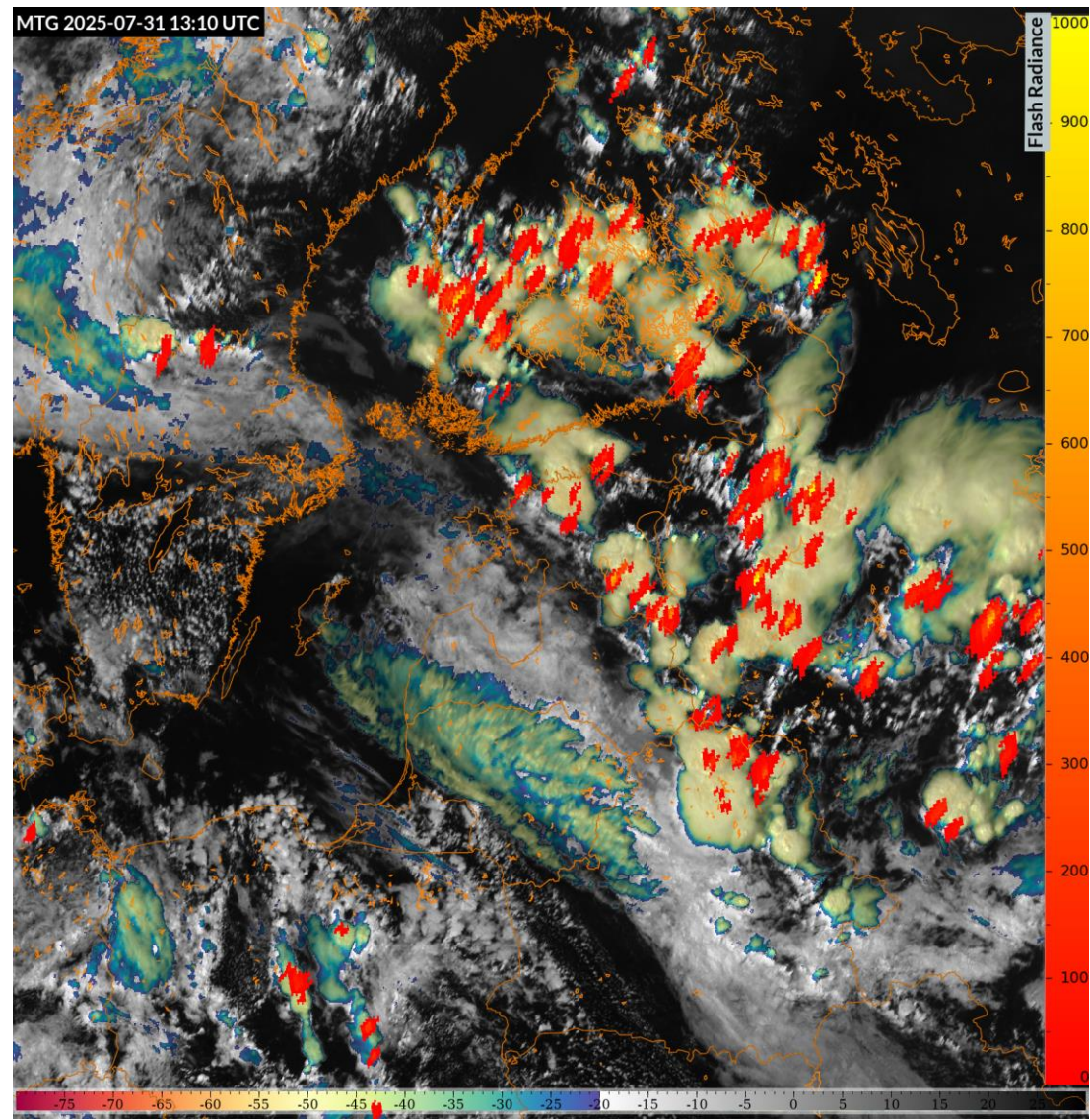
Wildfires in Portugal & Spain, 15.08.2025



True Colour RGB

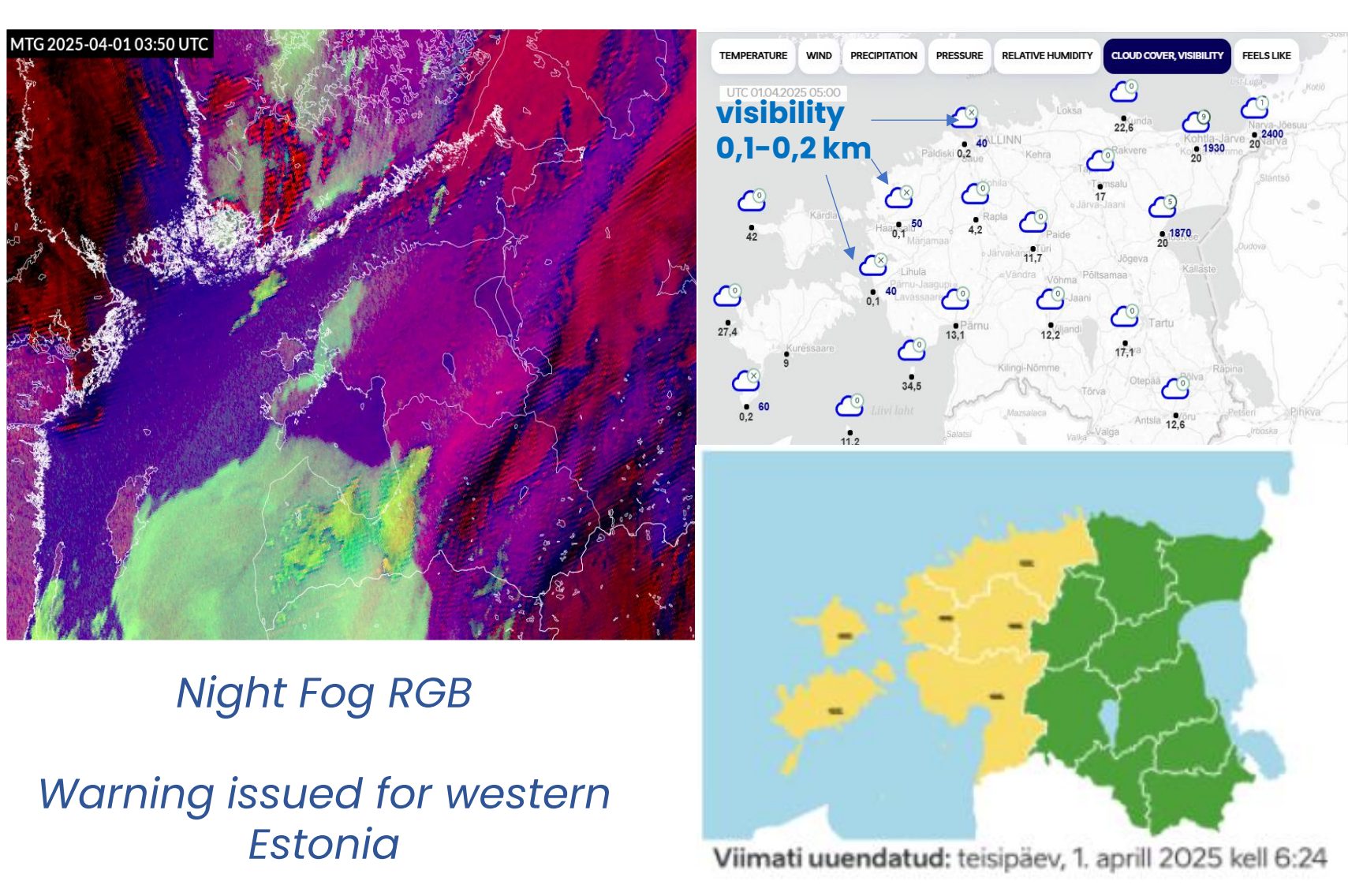
Cloud Phase RGB

Powerful thundercloud zones, 31.07.2025



Sandwich RGB + LI L2 AFR

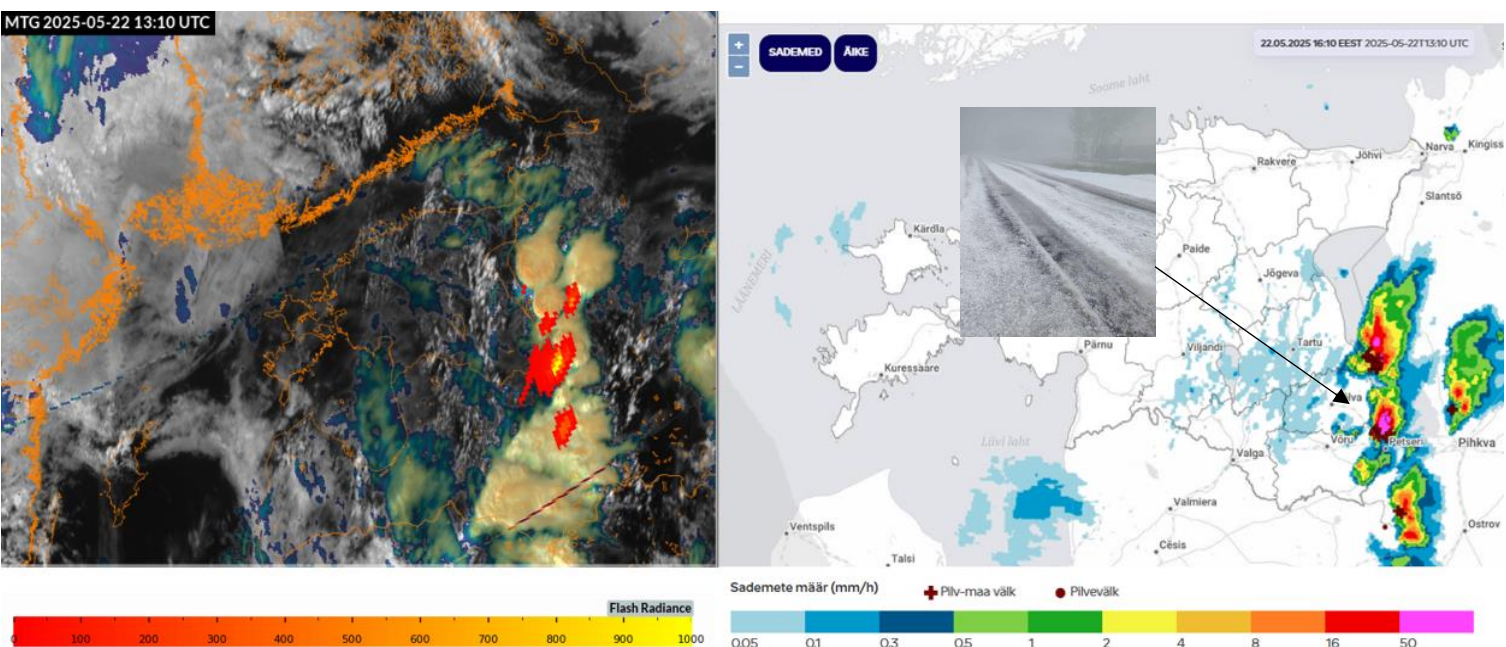
Thick fog with visibility less than 200 m, 01.04.2025



Night Fog RGB

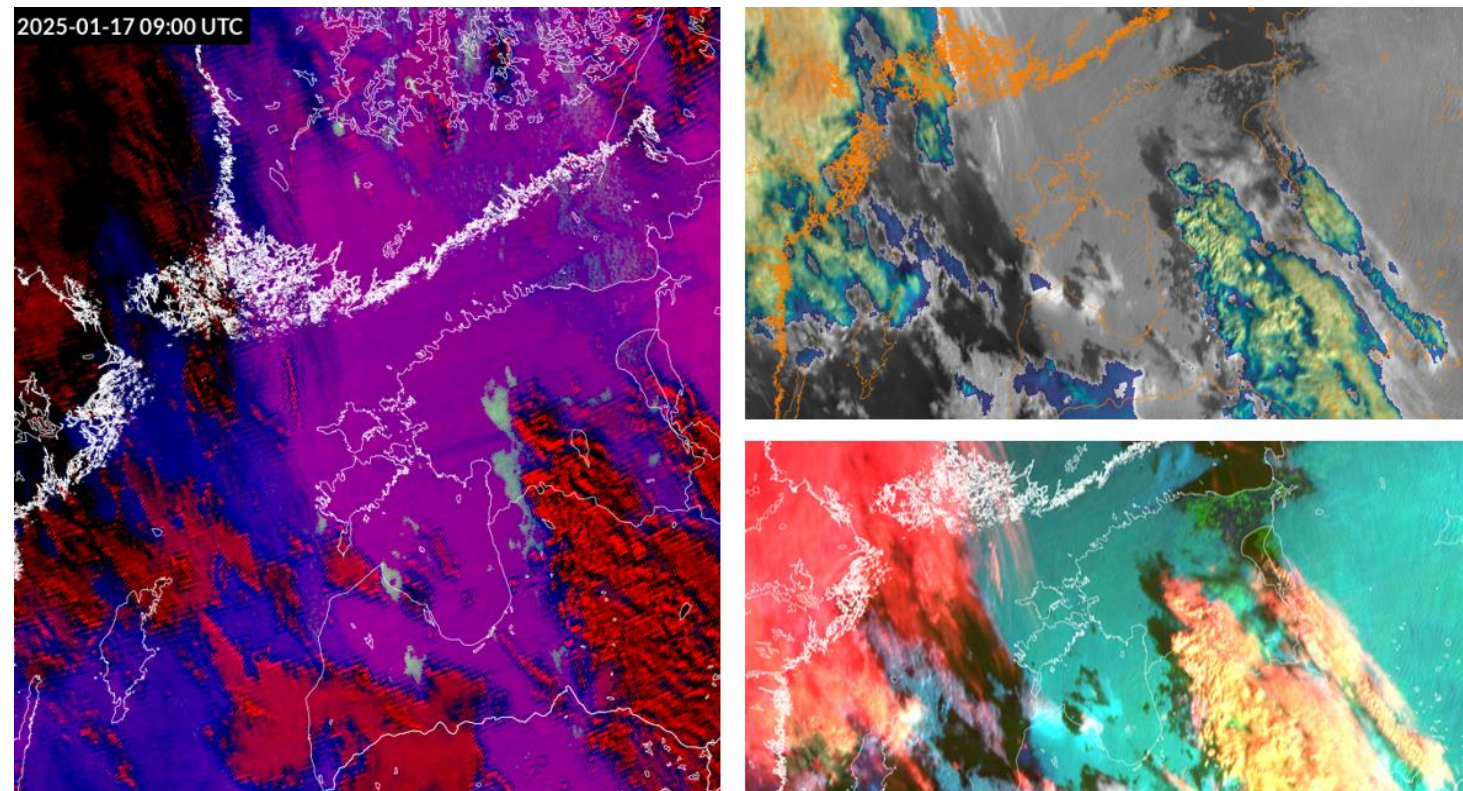
Warning issued for western Estonia

Strong convection with hail & lightning, 22.05.2025



Sandwich RGB + LI L2 AFR product and radar data

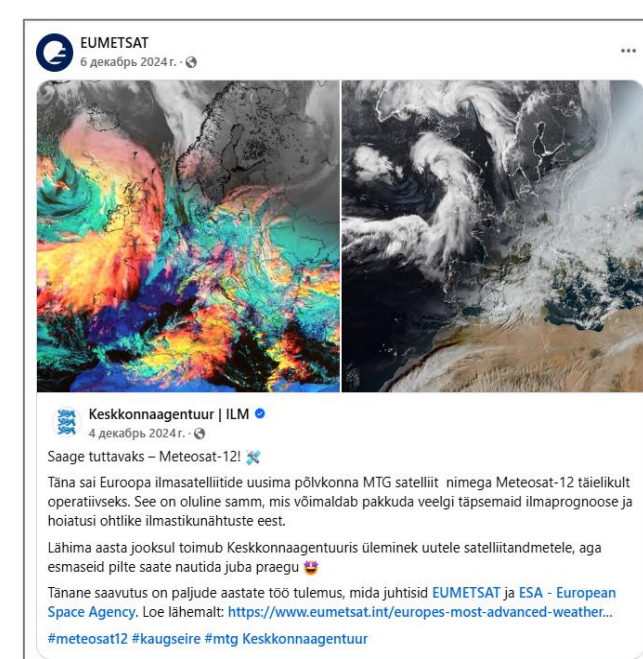
Shade effect at low solar angles, 17.01.2025



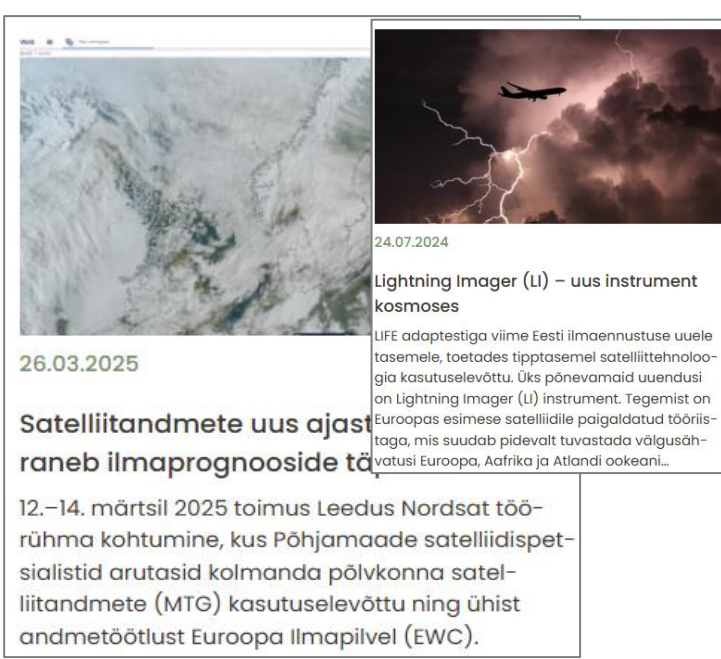
Cloud shades can be interpreted as low-level clouds/fog

LIFE-SIP AdaptEST project






Transition to MTG and EPS-SG data is supported by the LIFE-SIP AdaptEst project, focused on „Implementation of national climate change adaptation activities in Estonia“.







Raise public awareness of MTG data through social media, press releases, and other public channels



CHALLENGES

-  **BIG DATA & LATENCY**
 - RECEPTION
 - VISUALIZATION
 - DISPLAY
-  **SOFTWARE UPGRADES**
-  **RAPID RELEASES**
 - NEW DATA & PRODUCTS
-  **NEW RGBs INTEGRATION**
-  **STAFF SHORTAGE**

PLANS

-  **PROVIDE & PROMOTE**
 - MTG DATA
-  **INSTALL & INTEGRATE**
 - NWCSAF/GEO v2025
 - Open GeoWeb
-  **VISUALIZE & INTEGRATE**
 - NEW MTG L2 PRODUCTS
 - WEB PAGE/MOBILE APP
-  **TRAININGS & WORKSHOPS**

NORDSAT GROUP

- ✳ Estonia is a member of **NORDSAT** – a working group of Nordic satellite specialists.
- ✳ Regular meetings provide opportunity to share knowledge, exchange experience & collaborate.
- ✳ Operational processing of MTG FCI is set up on **EWC** using **NORDSAT common resources**; imagery is available via an internal WMS.
- ✳ Quick support at every step is provided by **PyTROLL developers** via dedicated Slack channel.

ACKNOWLEDGEMENT

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