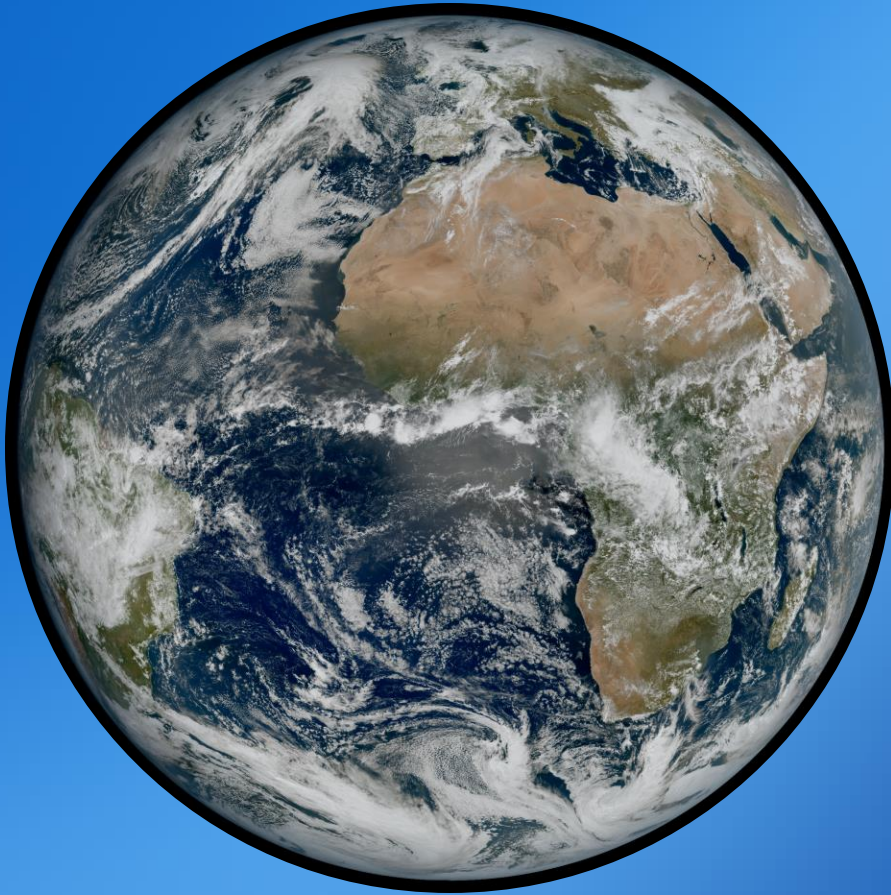


Satellite products in operational meteorology and hydrology: supporting hazard monitoring and disaster response



*First image of a Third Gen Meteorological
Satellite (MTG FCI True Colour RGB 2023-03-18)*



*Adas Pranckevičius
Chief Specialist
Climate and Research Department
2026-10-01*

A hazard is developing. What do we need to know?

WHERE?

Where is it developing, and which areas are affected?

HOW IS IT CHANGING?

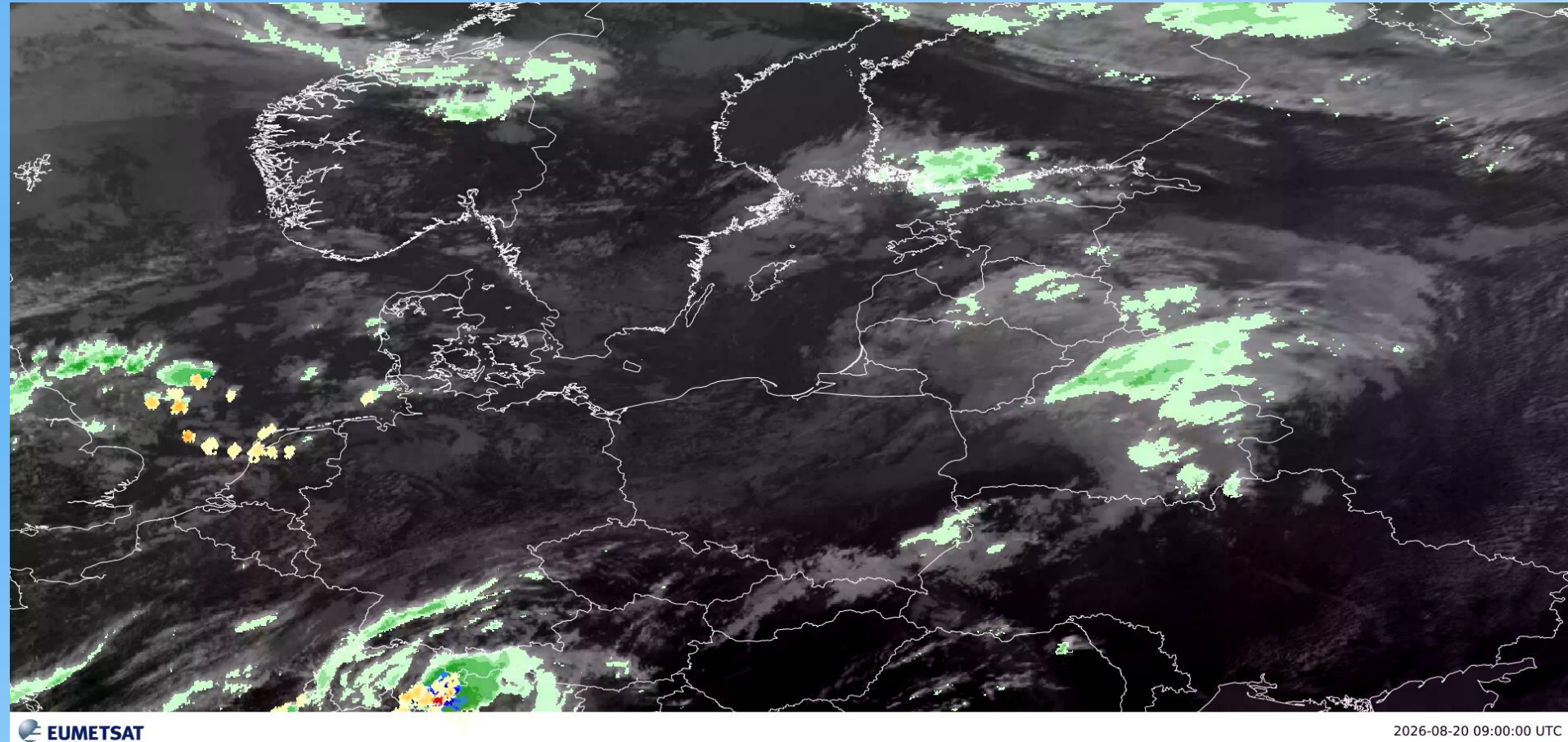
Is it intensifying, spreading or receding?

WHEN?

When severe weather is going to impact our region?

WHAT NEXT?

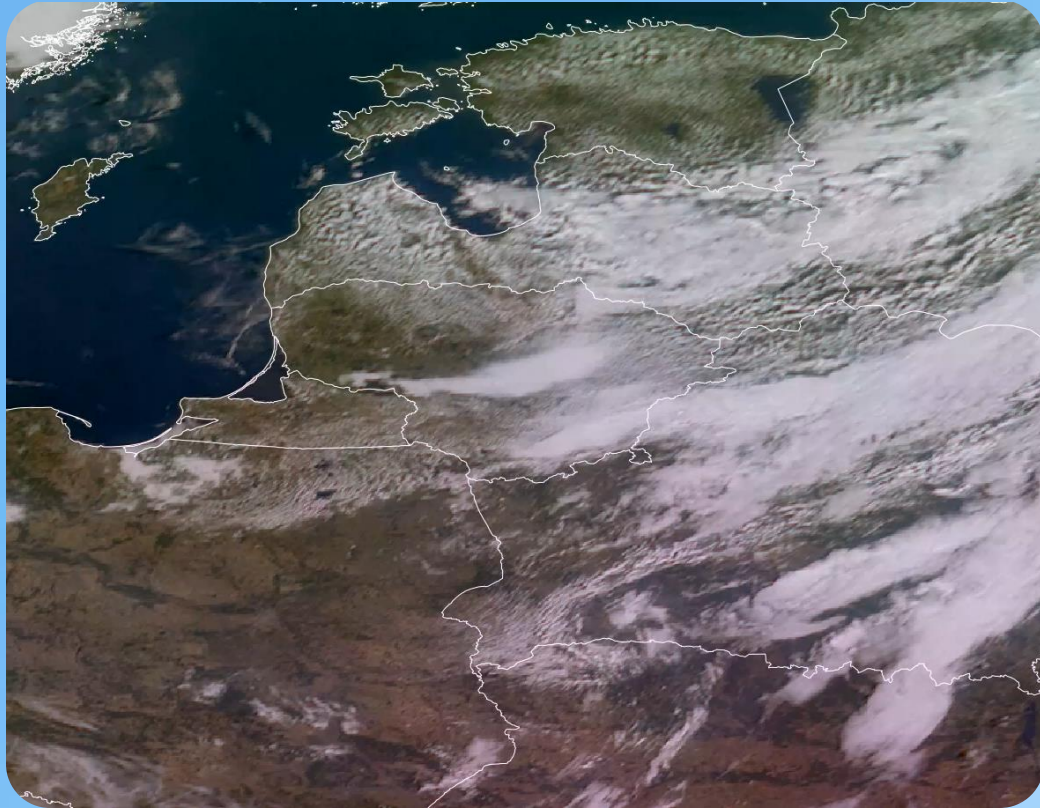
Where should we focus monitoring and further assessment?



What can satellite observations add to this picture?

Different views from space. Which one is more useful?

Geostationary orbit MTG FCI 2026-09-27



Poorer spatial resolution
Greater temporal resolution

Low orbit Sentinel-2 MSI 2026-09-27

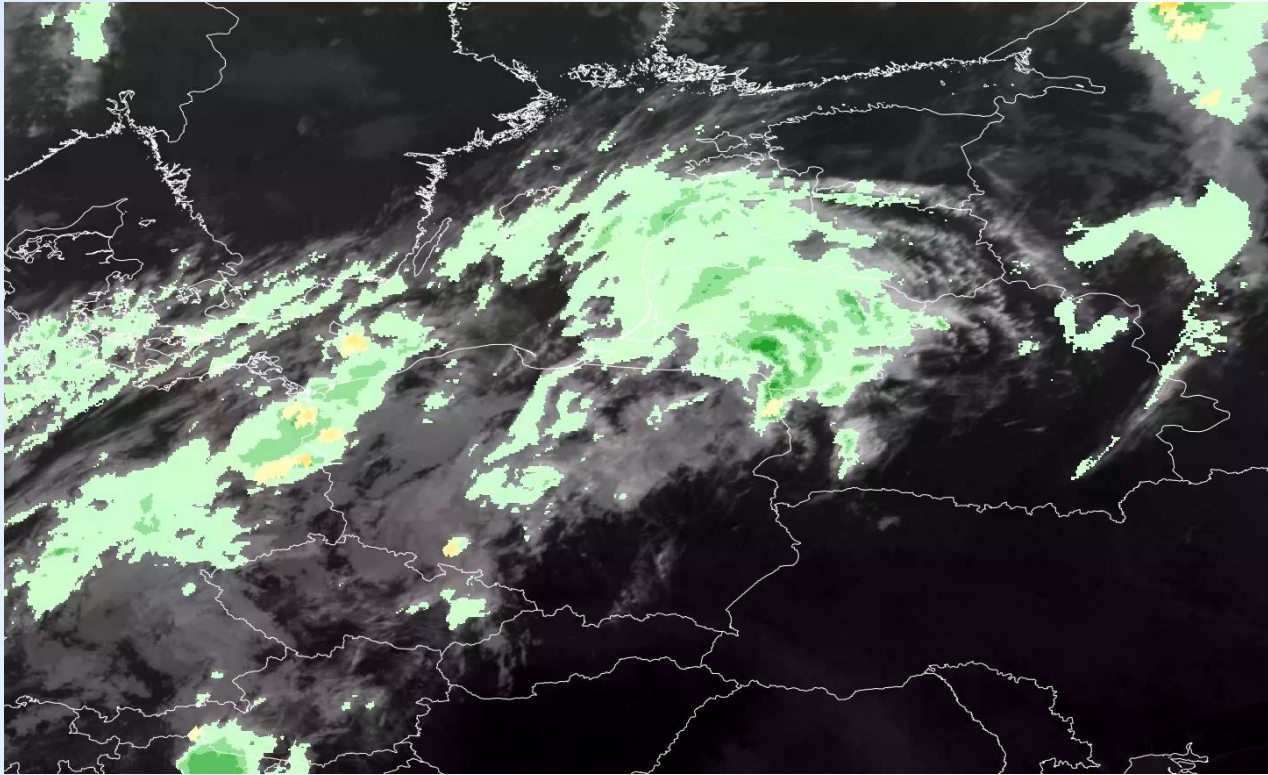


Greater spatial resolution
Poorer temporal resolution

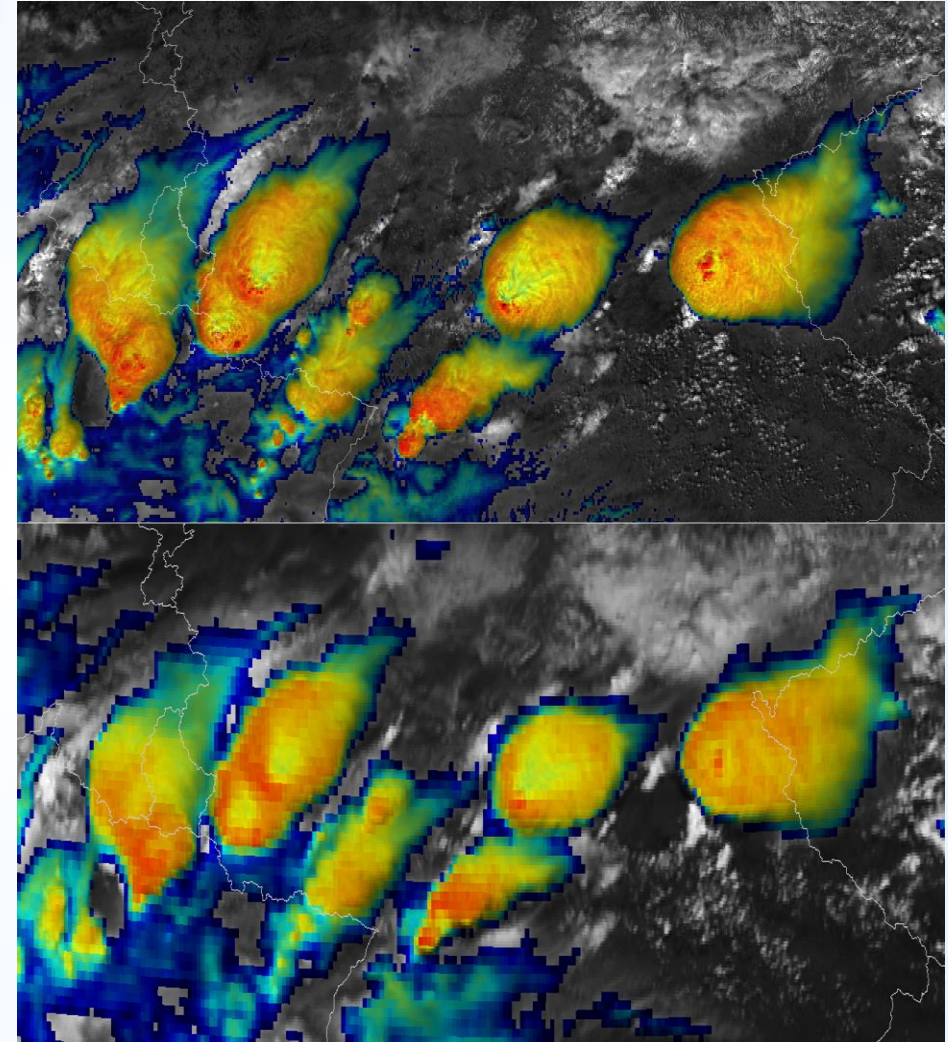
Thunderstorms: recognising rapid development

MTG

Unusual development on 2026-08-01

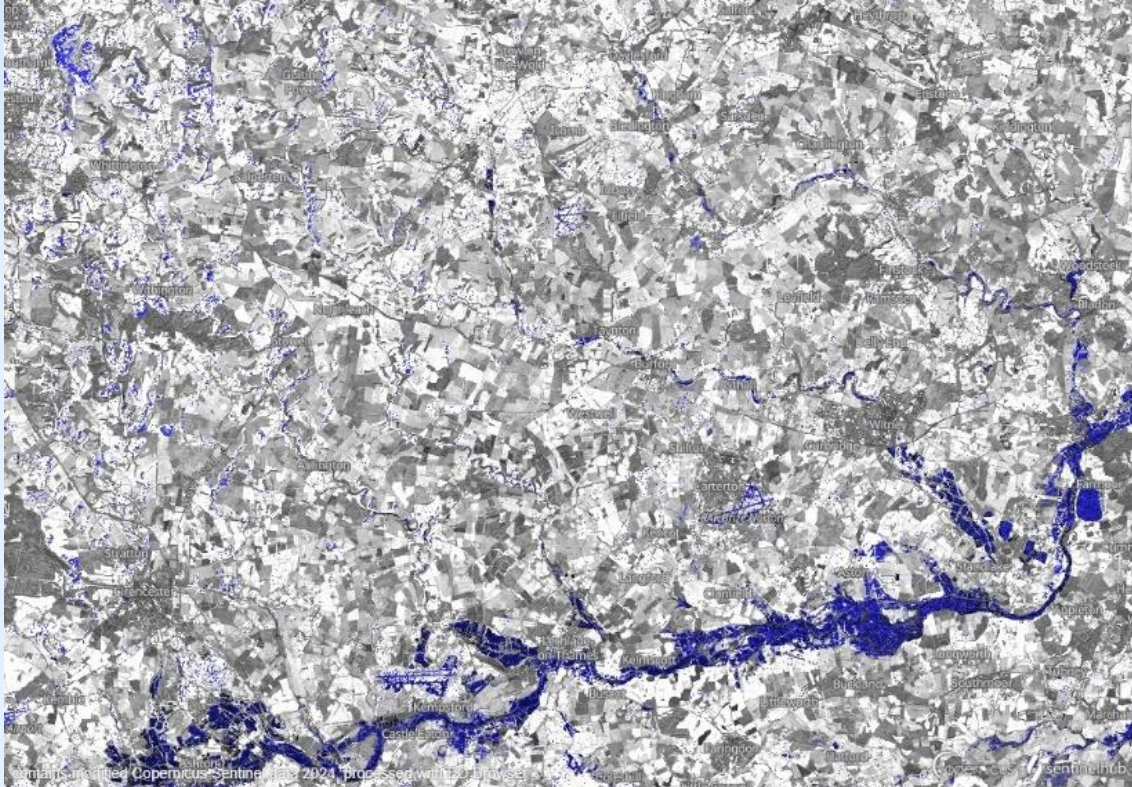


Convection monitoring MTG top image,
MSG bottom image



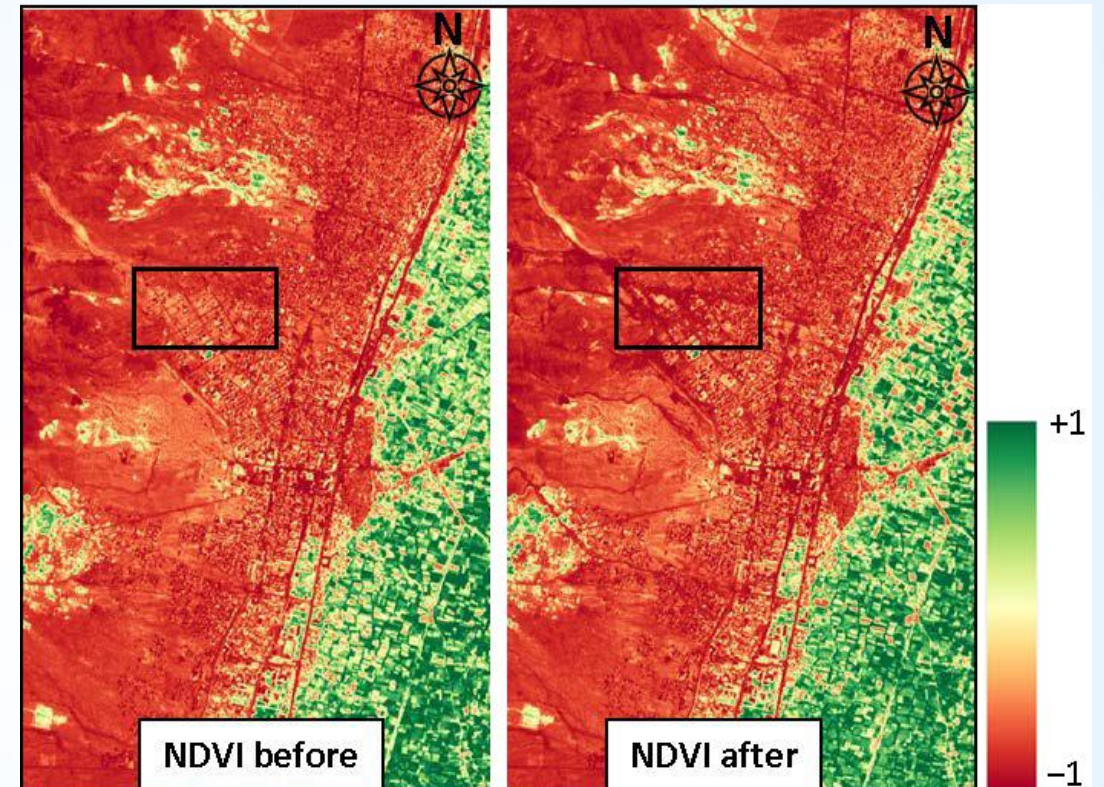
Flooding: seeing beyond individual gauges

Sentinel-1



Flash flood in the UK 2022-01-04.

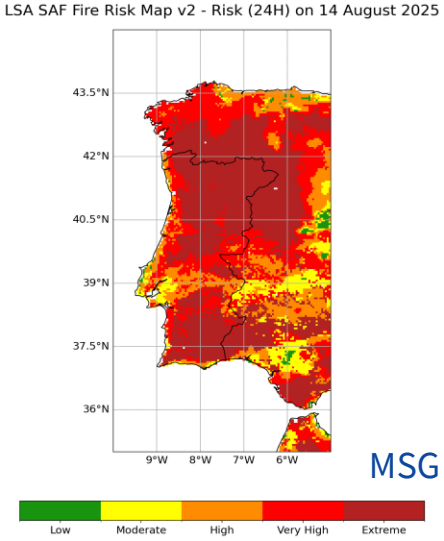
Sentinel-2



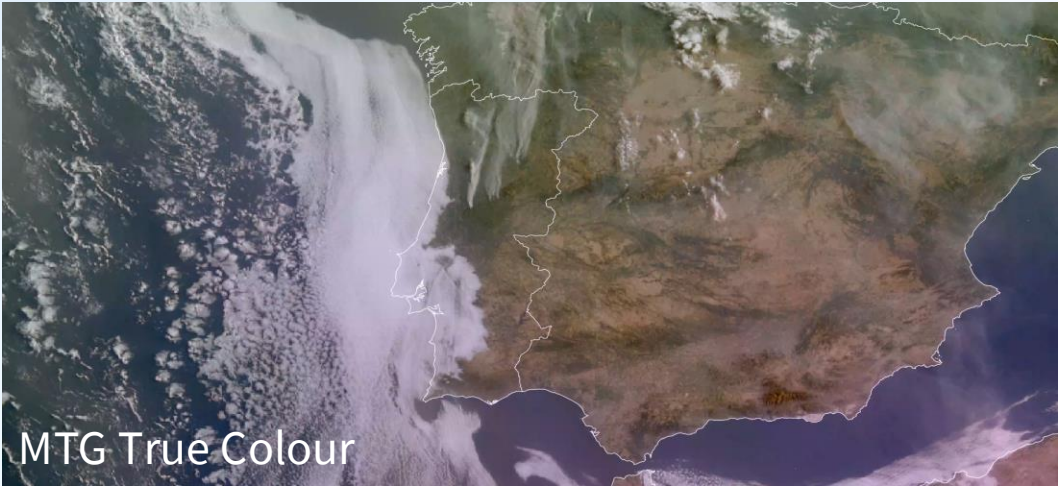
Flash flood area evaluated by NDVI difference in Afghanistan (Atefi et.al, 2022).

Fires: evaluating severity and damage

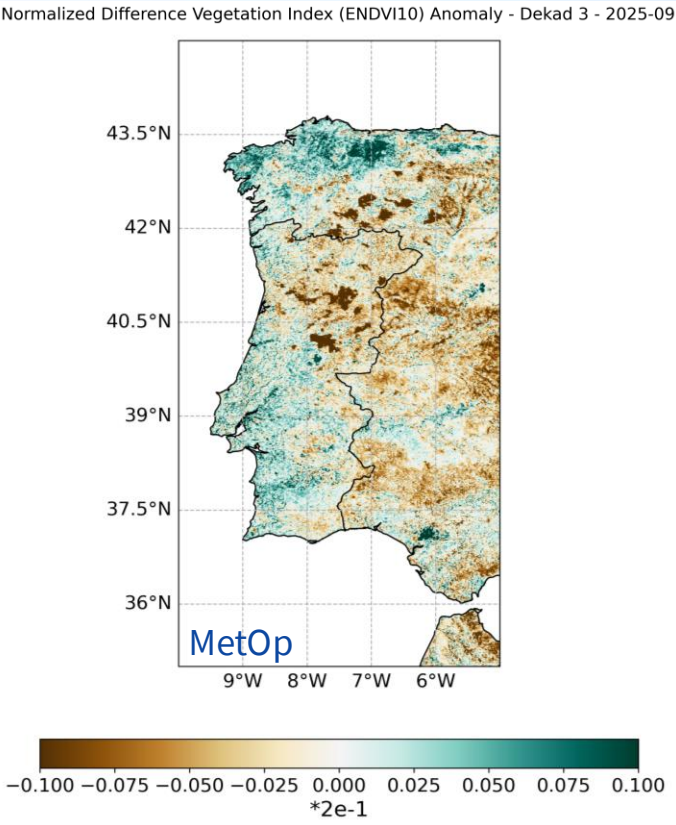
Before



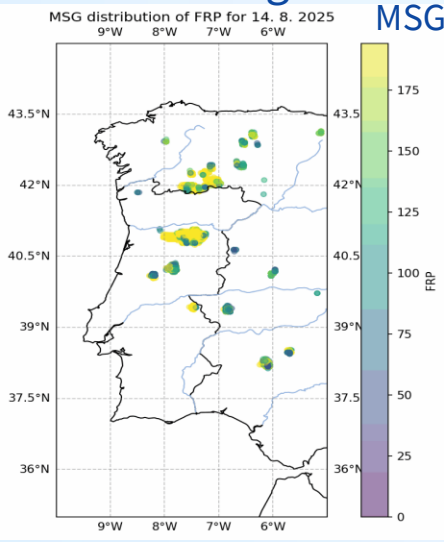
During



After



During



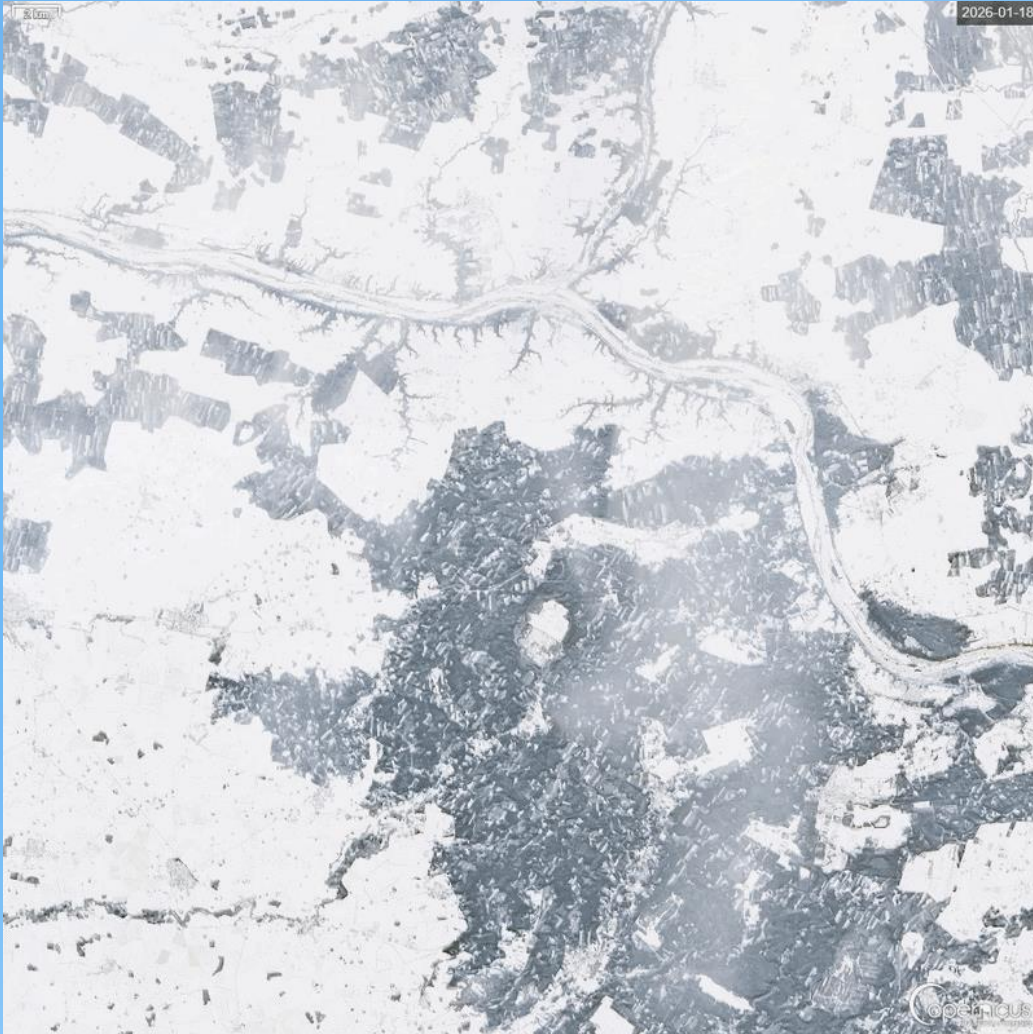
During



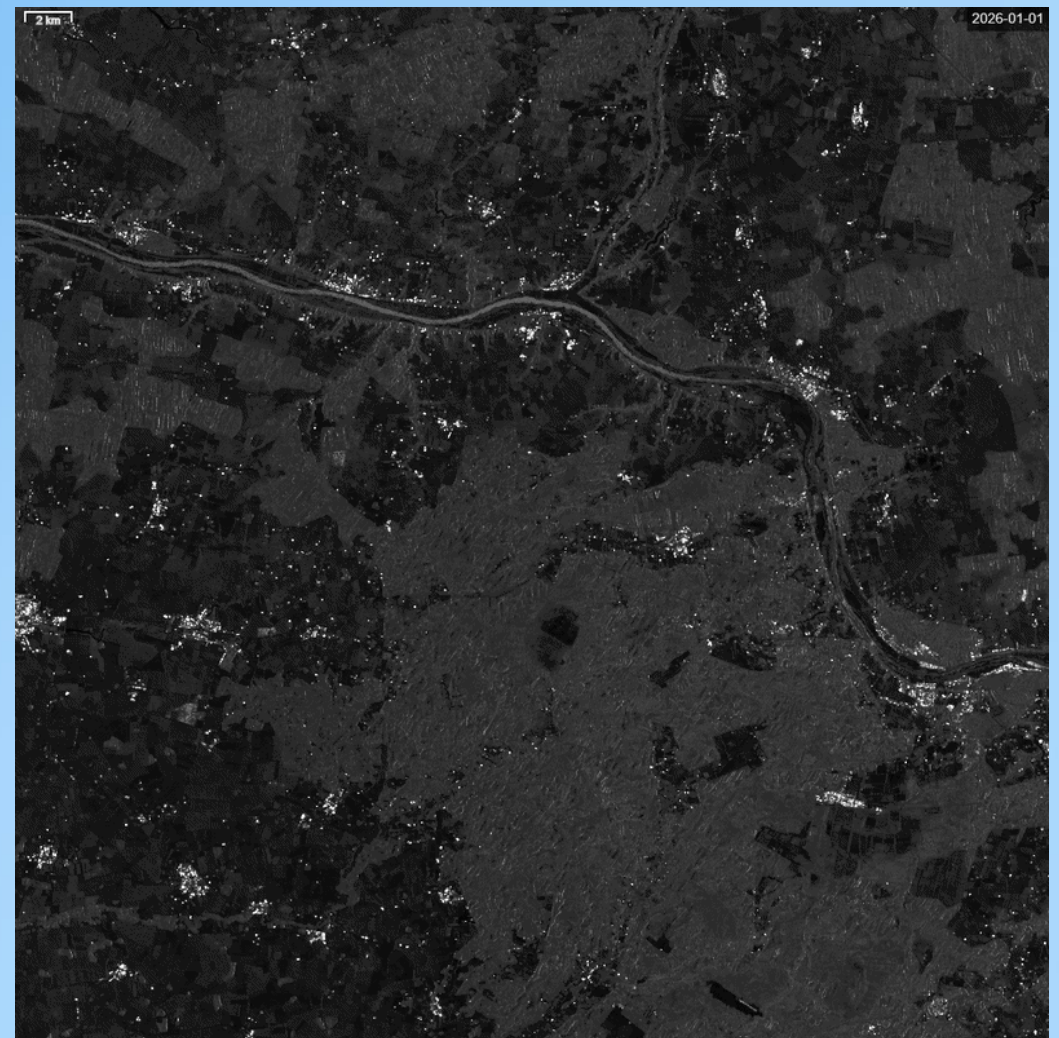
- **Frequent observations, limited detail.** We mainly use geostationary data to monitor weather development and support forecasting. Their spatial resolution limits local flood and damage assessment.
- **Detailed imagery may arrive too late.** Low-Earth-orbit satellite overpasses may miss the event's peak, processing and delivery add further delays.
- **Clouds can obscure the surface.** Optical imagery requires clear conditions, visible and near-infrared observations also require daylight. Radar works through clouds and at night, but interpretation can sometimes be challenging.
- **Observed hazards do not directly reveal impacts.** Assessing damage requires information on exposure, vulnerability and conditions on the ground.

**Operational value depends on timing, resolution
and interpretation together with other observations.**

From satellite observation to operational action



Sentinel 2 MSI (clouds<50%,
2026-01-01 – 2026-03-14)



Sentinel 1 SAR (Monthly IW swath
mosaic, 2026-01-01 – 2026-03-01)

Satellite information is most useful when it answers a specific operational question, arrives in time, and is interpreted together with other observations.

Thank you

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Meteo LT