



Overview on EUMETSAT products for drought monitoring - Products in use

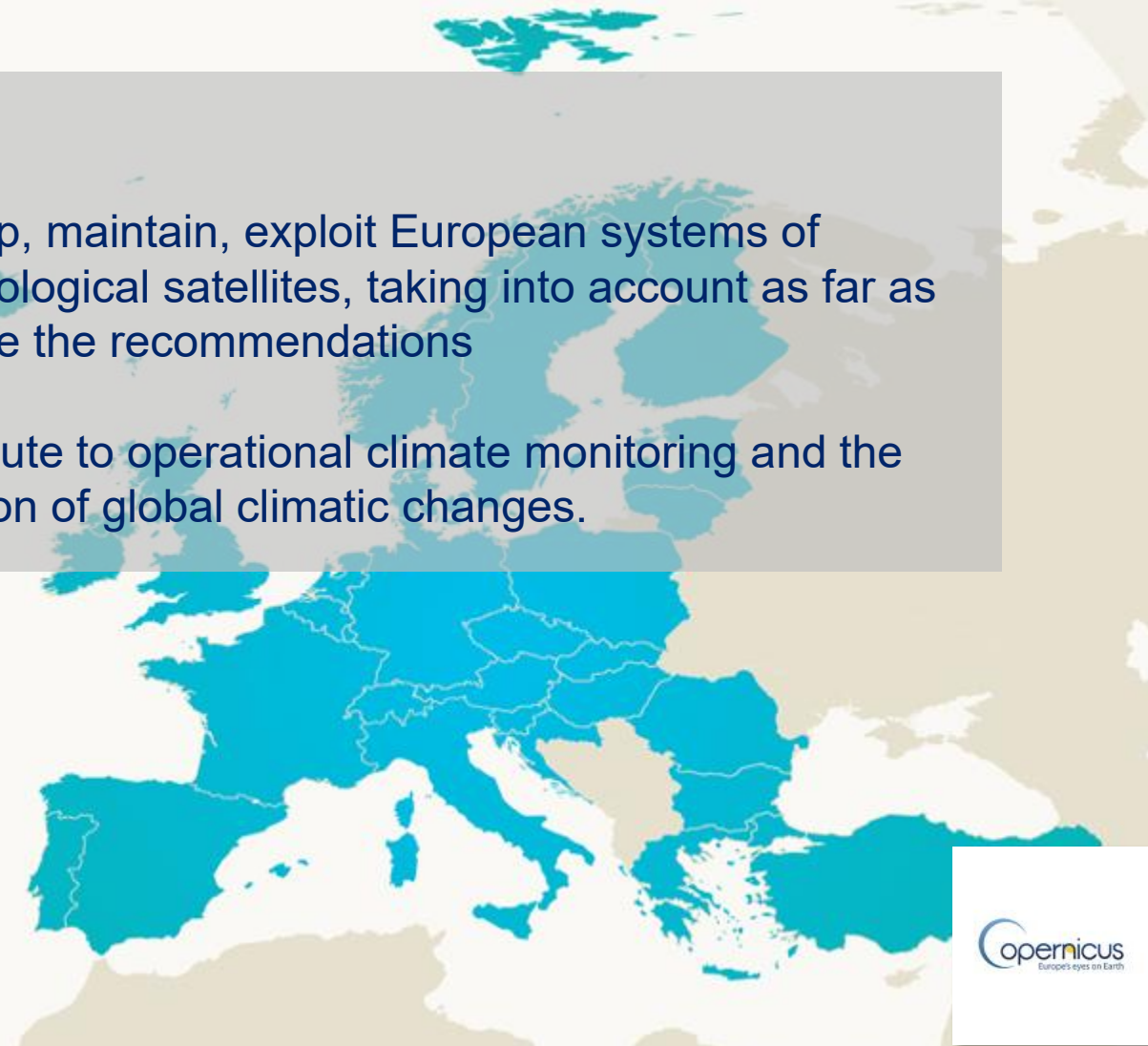
Christine Träger-Chatterjee

WMO Webinar "Drought Monitoring & Early Warning in RA VI", 23 April 2026

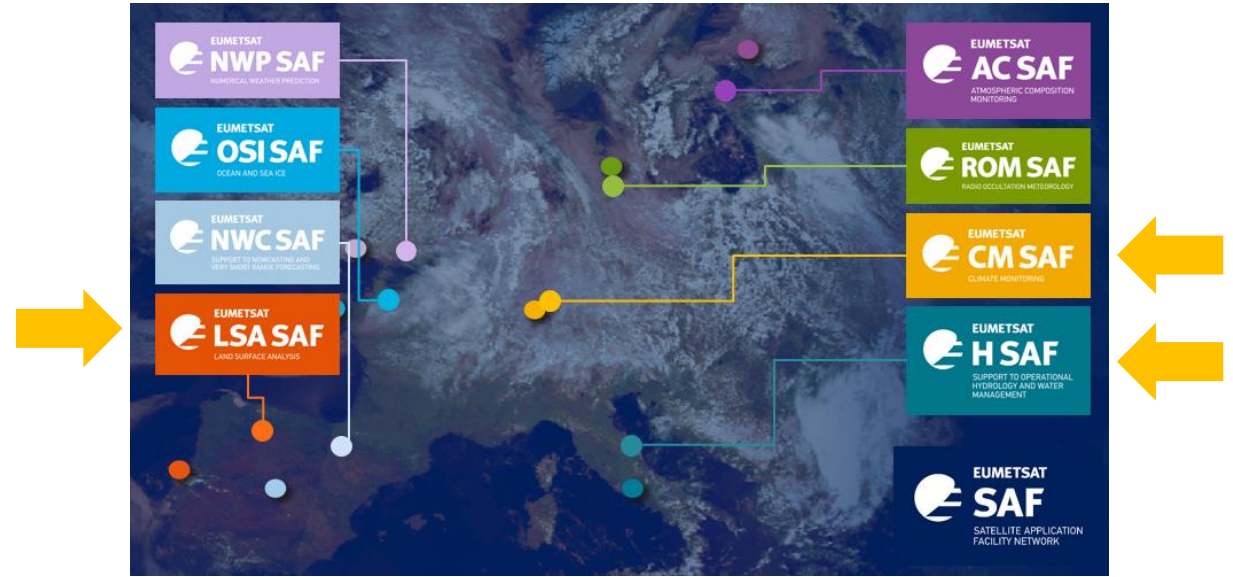


Tasks

- Develop, maintain, exploit European systems of meteorological satellites, taking into account as far as possible the recommendations
- Contribute to operational climate monitoring and the detection of global climatic changes.



- EUMETSAT has a network of different Satellite Application Facilities (SAFs)
- SAFs are dedicated centres of excellence for processing satellite data
 - research, development and operational activities
 - each SAF focusses on specific user communities or application areas



- Each SAF is a consortium of entities from EUMETSAT member states

What we do

- Providing satellite(based) observation products
 - L1 – radiances
 - L2 – geophys. Variable
 - L3 – L2 further processed
- Providing processing infrastructure
- (Supporting) Co-development

What we try out / develop

- Data Cube (demo)
- Climate Anomalies & Normals Service (in development, first release later this year)

What we do not do

- Provide ready to use drought monitoring products or systems
- Research on drought monitoring

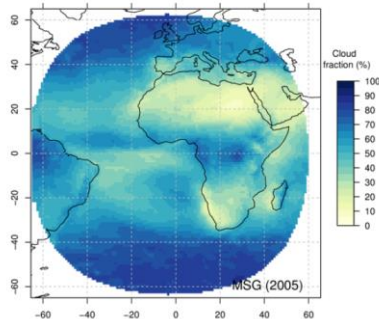


EUMETSAT's Satellite Application Facilities - Centres of Excellence

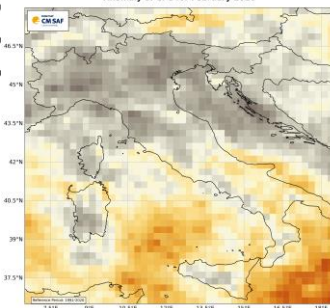
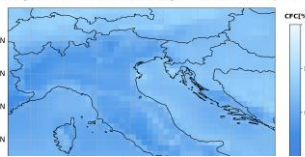
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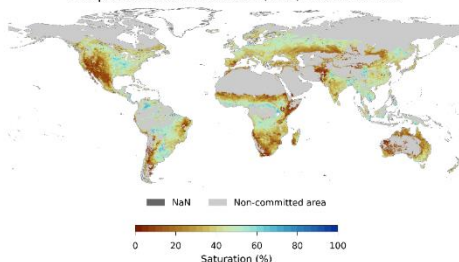
Cloud Fractional Cover



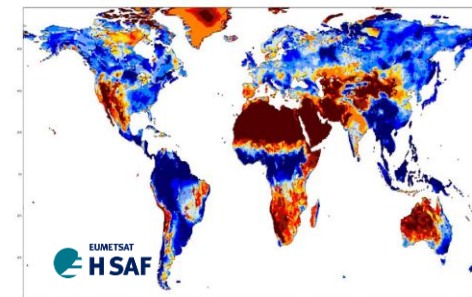
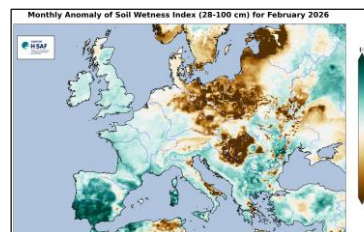
Monthly normal of CFC over Italy (1991-2020) on June



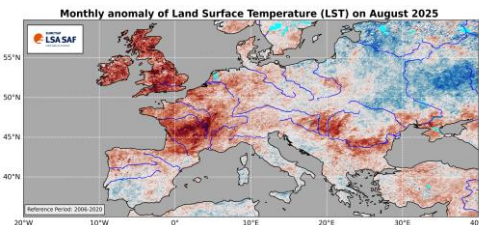
Metop ASCAT SSM CDR v7 12.5 km (H119) - Mean 2007-2020



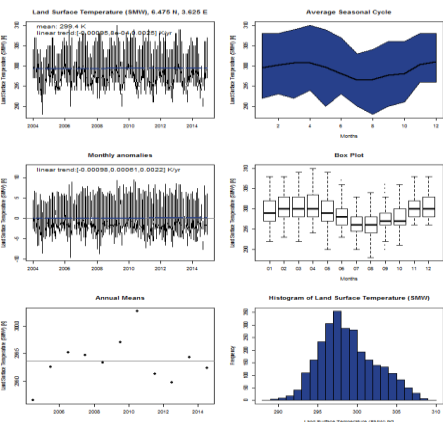
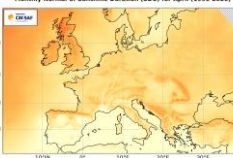
Soil Moisture



EUMETSAT LSA SAF LAND SURFACE ANALYSIS Land Surface Temperature



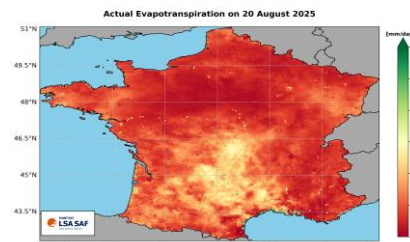
Monthly Normal of Sunshine Duration (SD) for April (1993-2020)



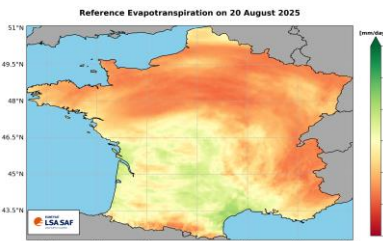
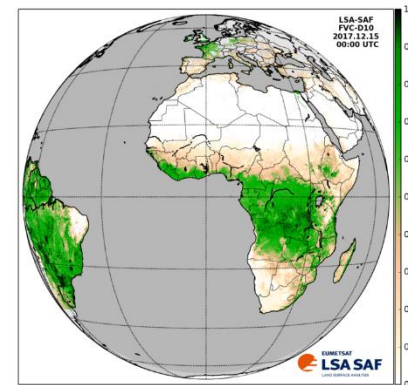
EUMETSAT SAF

SATELLITE APPLICATION FACILITY NETWORK

Reference Evapotranspiration















Vegetation Parameter, e.g. Fractional Vegetation Cover





Prototype Data Cube: Drought & Vegetation Monitoring

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Variable	Datasource	Temporal Coverage	Spatial Resolution	Temporal Resolution
 Global Radiation	Satellite	Jan 1983 – Current day – 1 / Current month – 1	0.05°	Daily & monthly
 Normal Solar Radiation	Satellite	Jan 1983 – Current day – 1 / Current month – 1	0.05°	Daily & monthly
 Sunshine Duration	Satellite	Jan 1983 – Current day – 1 / Current month – 1	0.05°	Daily & monthly
 Land Surface Temperature	Satellite	1 Jan 2016–current day-1	0.05°	Hourly
 Surface Evapotranspiration	Satellite	Jan 2004 – current day-1	0.05°	Daily
 NDVI	Satellite	Mar 2007– current decade (10 day period) -1	0.01°	10-daily
 Fractional Vegetation Cover	Satellite	Jan 2004 – current day-1	0.05°	Daily
 Leaf Area Index	Satellite	Jan 2004 – current day-1	0.05°	Daily
 Absorbed photosynthetically active radiation	Satellite	Jan 2004 – current day-1	0.05°	Daily
 Leaf Area Index (root zone)	Satellite	Jan 1992 –current day-1	0.01°	Daily
 Precipitation	In situ	Jan 1982 – current month-1	1°	Monthly
 T2m	Re-analysis	Jan 1979 –current month-1	0.01°	Monthly

Spatial Coverage:	Europe
Grid:	Regular Lat / Lon
Data Format:	CF compliant netCDF4

- access the data cube on a virtual machine hosted at EUMETSAT infrastructure
- download the entire cube or subsets / subsamples
- analyse the data on the VM using the CM SAF R Toolbox, Jupyter notebooks (or other tools) and download your result

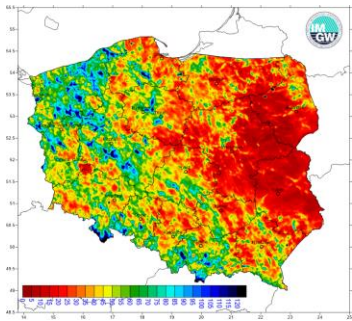
→ Find more information on the [EUMETSAT User Portal](#)

→ Contact us: ops@eumetsat.int

Support to farmers by IMGW-PiB, Poland

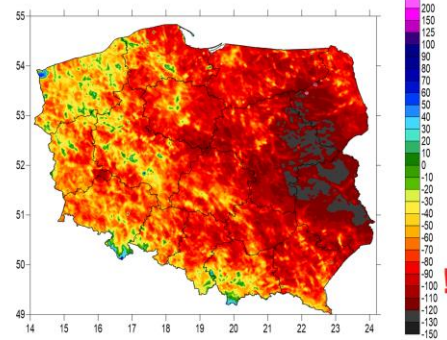


- agrometeo.imgw.pl – information platform for farmers, agricultural advisors, researchers and decision-makers.
- Integrating H SAF soil moisture and LSA SAF vegetation products to monitor the season:

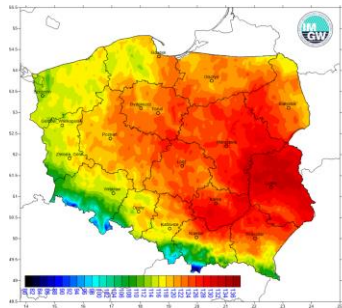


Evapotranspiration

from MSG ET Ref

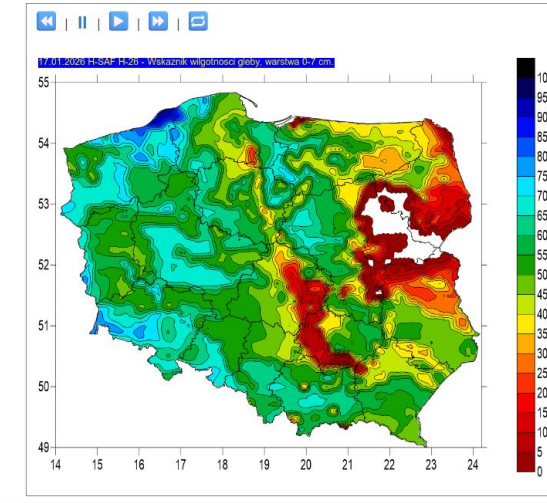


Climatic Water Balance – drought indicator

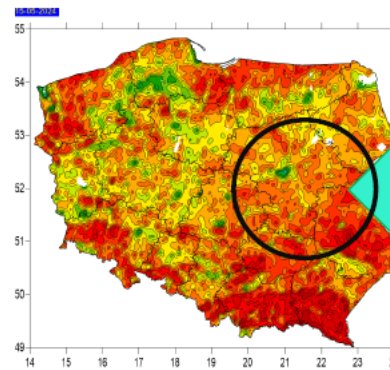


Precipitation

combined (multiple sources)

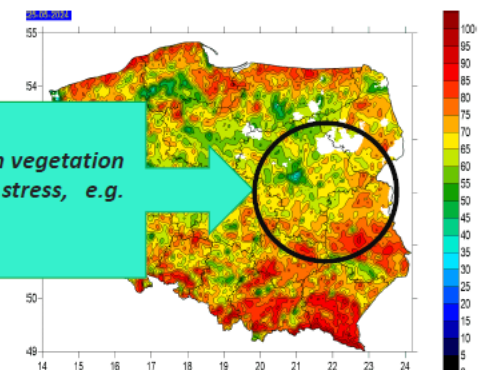


Soil Water Index derived from Surface Soil Moisture



from MSG LAI

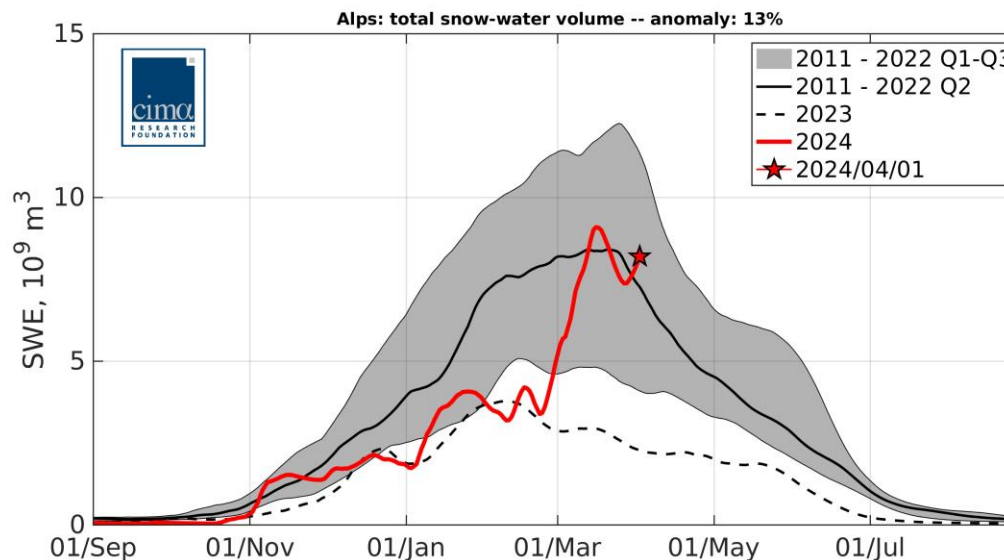
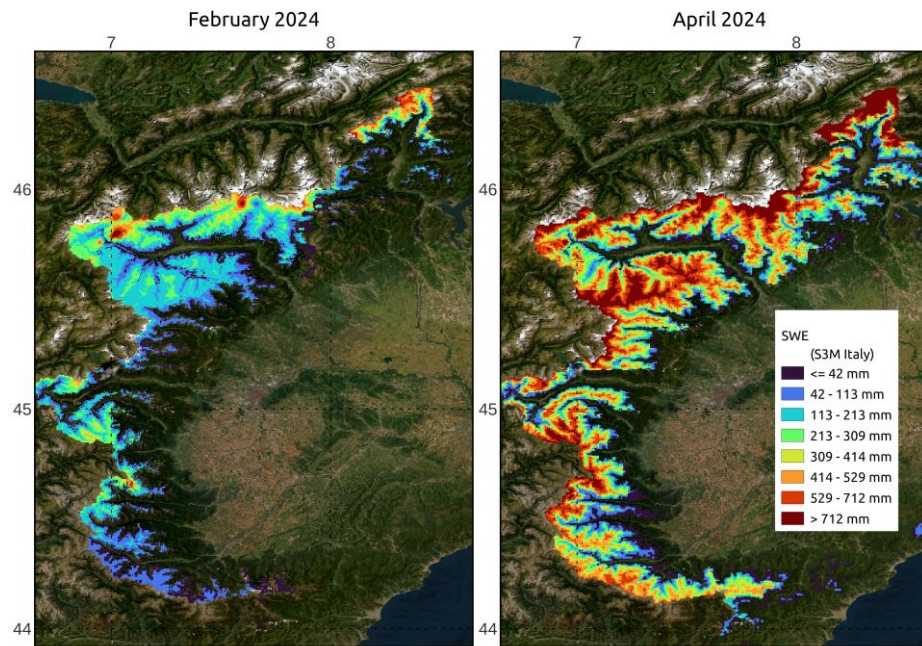
A sudden drop in values during periods when vegetation should be active may indicate climatic stress, e.g. drought or heat wave.





“Castelviero” canal for hydropower diversion, with a view of the Piave River and the Treviso Prealps
(credits: Nico Dalla Libera)

Distribution of SWE across north-western Italy, February vs. April 2024.



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Bollettino di criticità n° 035/2024
Giorno di emissione: mercoledì 3 aprile 2024

PROTEZIONE CIVILE
Presidente del Consiglio dei Ministri
Dipartimento della Protezione Civile

BOLLETTINO DI CRITICITA' NAZIONALE - ALLERTA DEL 03/04/2024
Effetti al suolo previsti per la giornata di oggi,
mercoledì 3 aprile 2024

OGGI

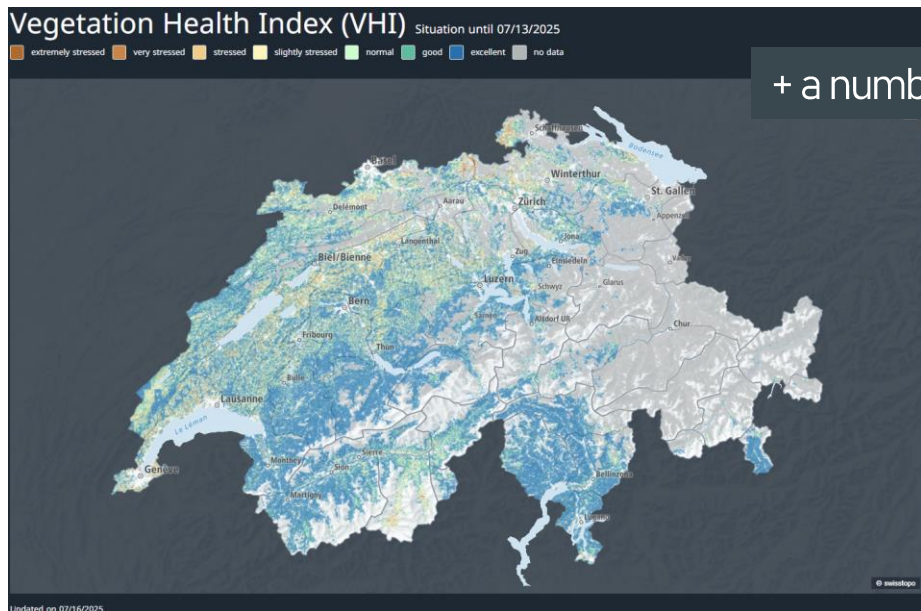
LEGENDA DI CRITICITA'

RISCHIO IDRAULICO	RISCHIO TEMPORALI	RISCHIO IDROGEOLOGICO
ELEVATA CRITICITA' (ALLERTA ROSSA)	MODERATA CRITICITA' (ALLERTA ARANCIONE)	ELEVATA CRITICITA' (ALLERTA ROSSA)
MODERATA CRITICITA' (ALLERTA ARANCIONE)	MODERATA CRITICITA' (ALLERTA ARANCIONE)	MODERATA CRITICITA' (ALLERTA ARANCIONE)
MODERATA CRITICITA' (ALLERTA GIALLA)	MODERATA CRITICITA' (ALLERTA GIALLA)	MODERATA CRITICITA' (ALLERTA GIALLA)
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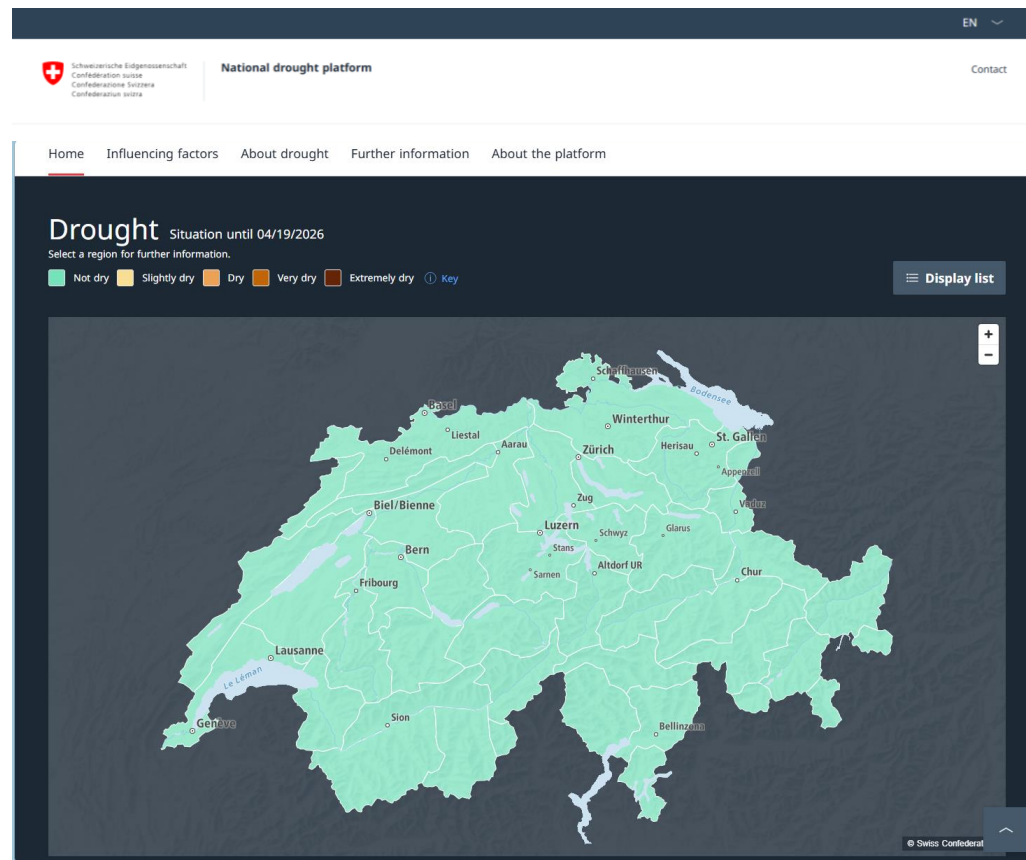
ASSENZA DI FENOMENI (NESSUNA ALLERTA) VALUTAZIONE NON TRASMESSA Regioni Zone di allerta

Information is used in hydrological bulletins published operationally by the Italian Civil Protection

Long time series of SWE observations allow to put the current situation into historic context.



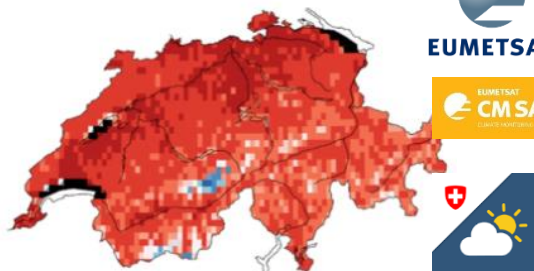
+ a number of other parameter



Sentinel-2 Vegetation NDVI (swisstopo)



Meteosat Land Surface Temperature (MeteoSwiss)



$$VCI = \frac{NDVI_{current} - NDVI_{Ref,min}}{NDVI_{Ref,max} - NDVI_{Ref,min}} \times 100\%$$

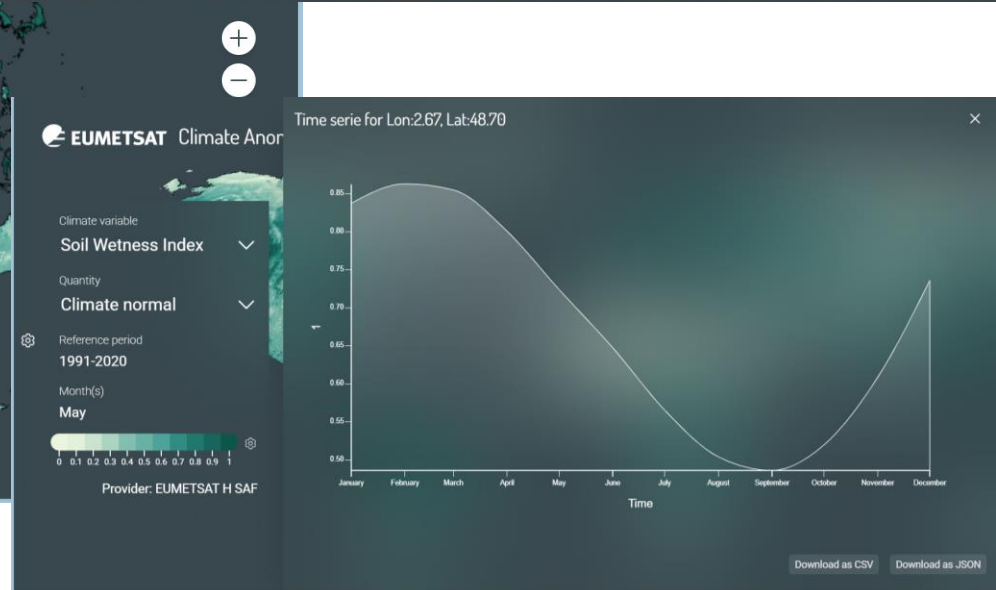
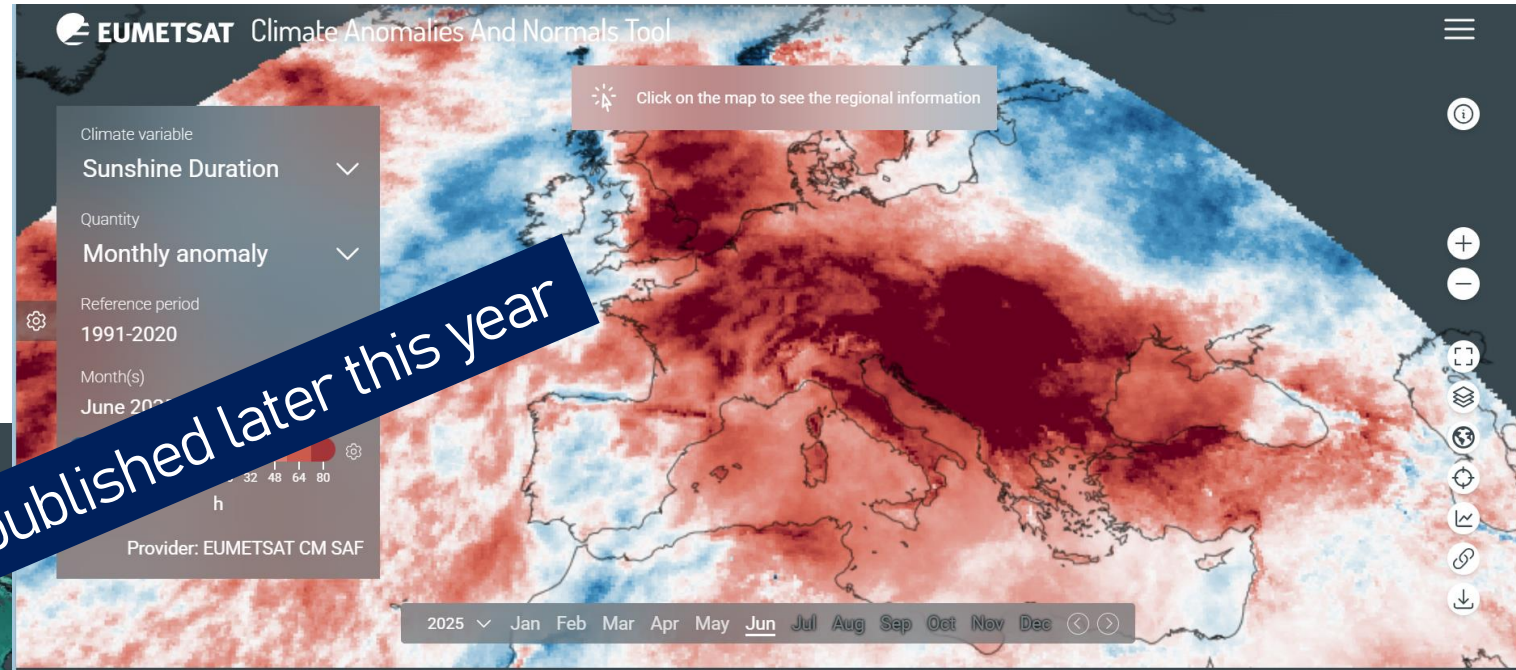
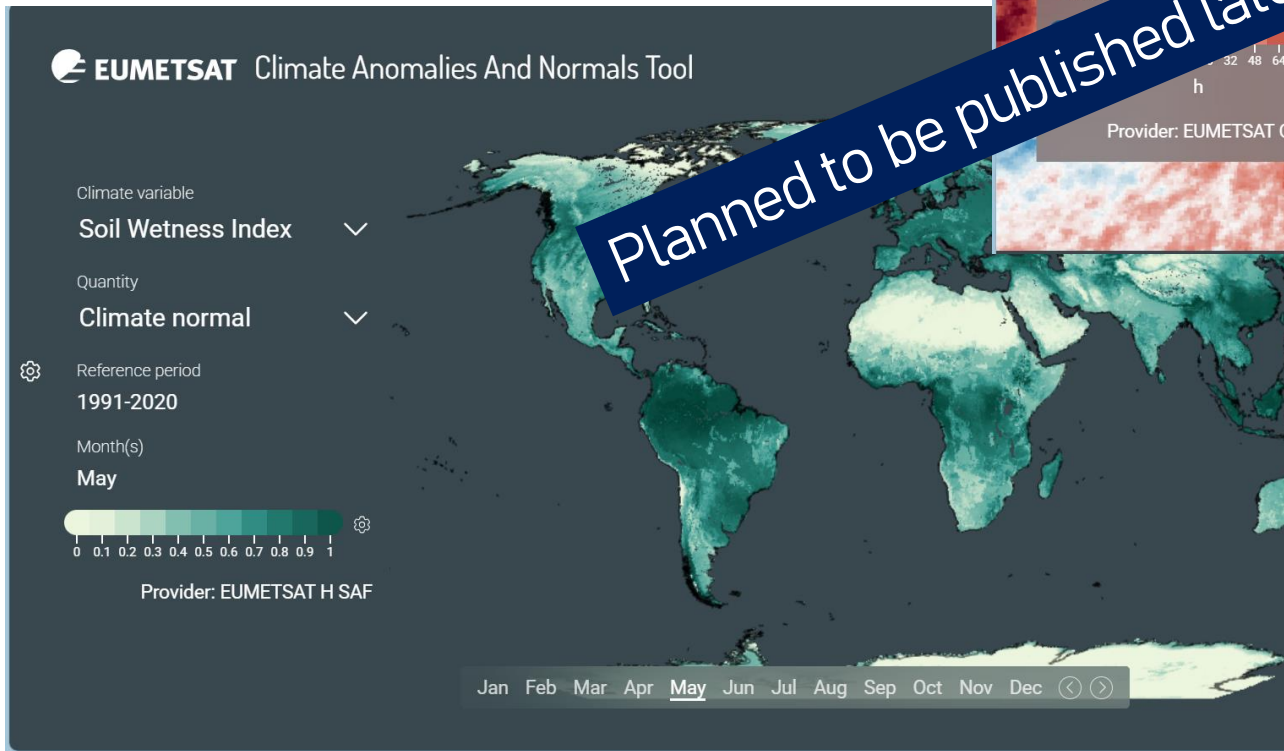
$$TCI = \frac{T_{Ref,max} - T_{current}}{T_{Ref,max} - T_{Ref,min}} \times 100\%$$

$$VHI = \alpha VCI + (1 - \alpha) TCI, \text{ where } \alpha = 0.5$$

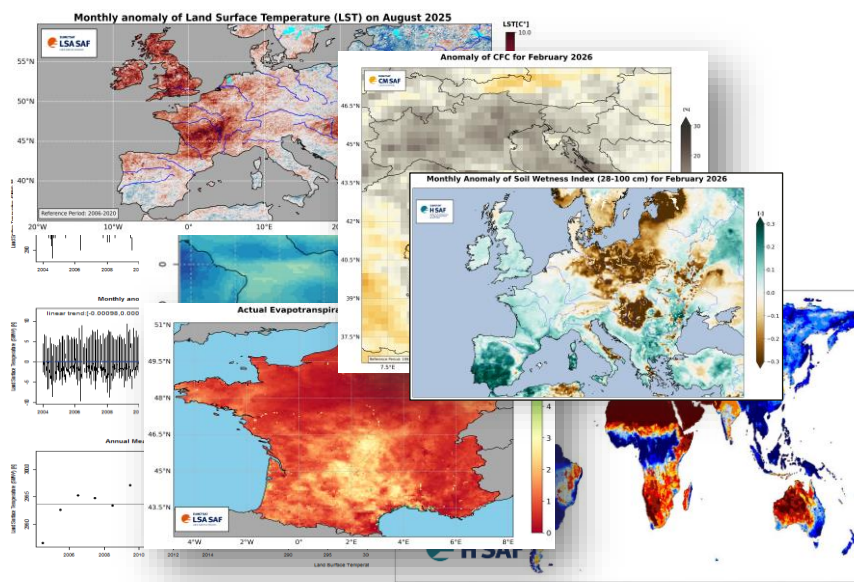
EUMETSAT Climate Anomaly Service

- Provides anomalies with a monthly latency based on coupled CDR&ICDR
- First release planned for 2026

Planned to be published later this year



- Your needs and wishes are always welcome.
- Share your thoughts and ideas.
- Experiment with data on available platforms
- We are ready to help you navigate the system
- Reach out to
 - ops@eumetsat.int / christine.traeger@eumetsat.int





Thank you!

Questions are welcome.

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