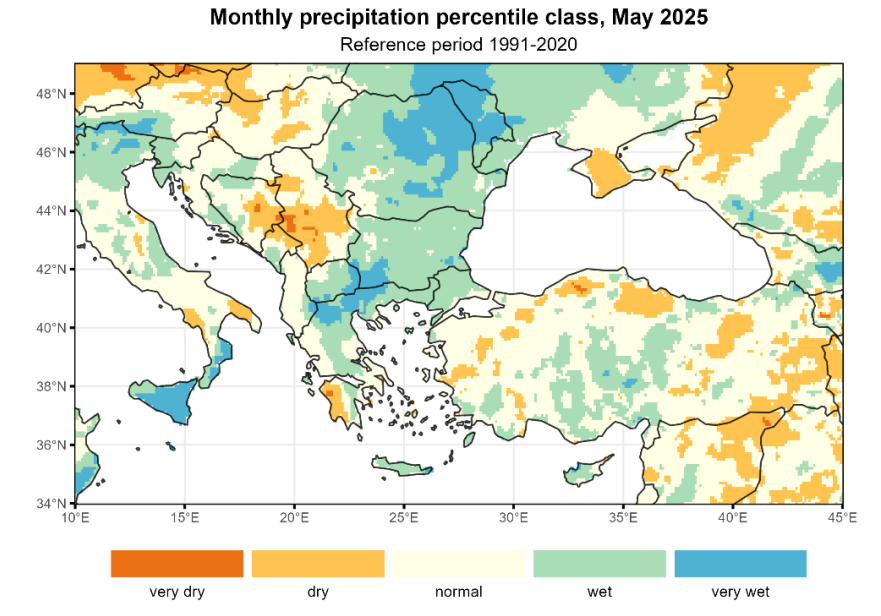
DROUGHT MONITORING BULLETIN

May 2025

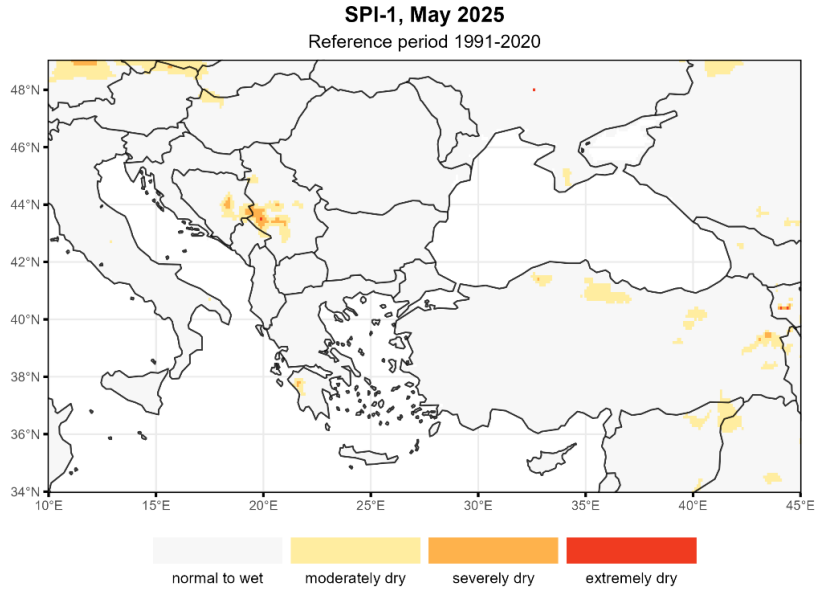
HOT SPOT

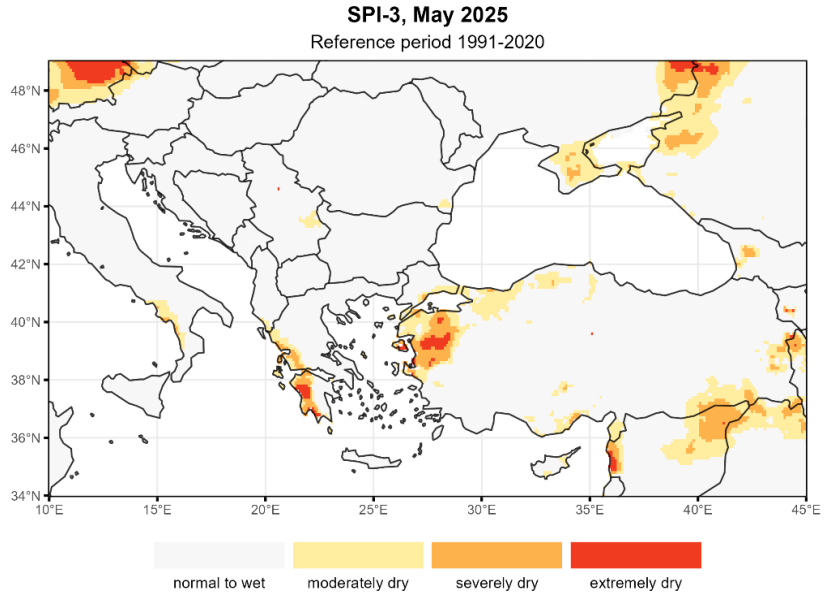


- May brought diverse precipitation conditions scattered across the region, with several parts experiencing very wet May while others recorded a dry to very dry month.
- On a monthly basis, May's above-average rainfall rate was in Moldova, eastern Romania and over to eastern Bulgaria the first since the beginning of the year, after four consecutive drier-than-normal months in 2025.
- Most outstanding compared to the long-term were precipitation conditions across eastern half of Balkan Peninsula stretching over to North Macedonia and across much of Greece, with most of Moldova, northeastern Romania and locally in northern Greece recording one of the highest monthly rainfall rates in last decades (>95th percentile).
- Southwestern part of Greece continued with another month of under-average or at best normal levels of precipitation, as did all months of 2025 so far over that part of the country.

PRECIPITATION CONDITIONS

Figures below show standardized precipitation index **SPI for May 2025 at one- and 3-monthly scales**. Monthly SPI indicates possible drought conditions which may have impact on vegetation health, while SPI over a three-monthly period can be indicative also for surface water status.





- May brought much higher than normal amount of rain to northern Moldova, eastern part of Romania and to southwestern Bulgaria where monthly accumulations exceeded the long-term average levels for up to 100 mm, over northeastern Romania for up to 125 mm.
- May was wetter than usual also across the rest of Romania and Bulgaria, over northern Greece and across northwestern Slovenia, with up to 75 mm higher than usual amount of rain.
- It was a dry month only for localised areas across the region, including northern Hungary, central-eastern Serbia over to Bosnia and Herzegovina, and scattered areas over northern to eastern Turkey. Monthly precipitation level was in those areas up to 50 mm lower than normal, locally up to 75 mm lower, indicating mostly moderate drought conditions.

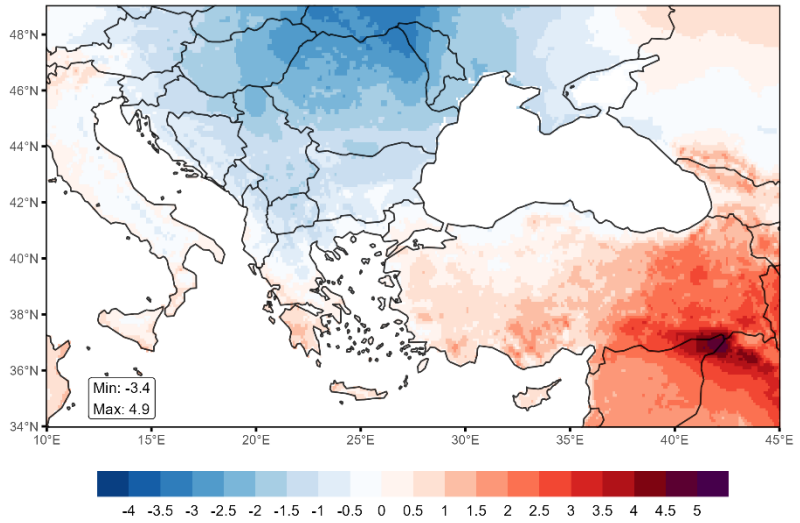
- SPI3 reveals 3-monthly (spring) precipitation accumulations were still well under-average across western Greece and over far northwestern and far southeastern Turkey. Over the March-May period, these areas accumulated between 75 and 125 mm of deficit, in southeastern Turkey up to 150 mm, indicating severely to extremely dry spring, compared to the long-term normal for these parts of the region.
- Much of these areas experienced normal to wet April and May, thus the accumulated 3-monthly deficit this spring comes mostly on the account of extremely dry March, in western Greece also moderately dry April.

AIR TEMPERATURE AND SURFACE WATER BALANCE

Figures below show anomalies of **monthly mean air temperature and 2-monthly accumulated surface water balance** (precipitation reduced for evapotranspiration) in absolute units and in percentile classes for **May 2025** in comparison to the 1991-2020 reference datasets. The two extreme percentile classes have a 5-percent range, and each of the middle three classes has a 30-percent range. A percentile value (class) indicates the position of a score within a dataset, showing the percentage of scores that fall below (within) it.

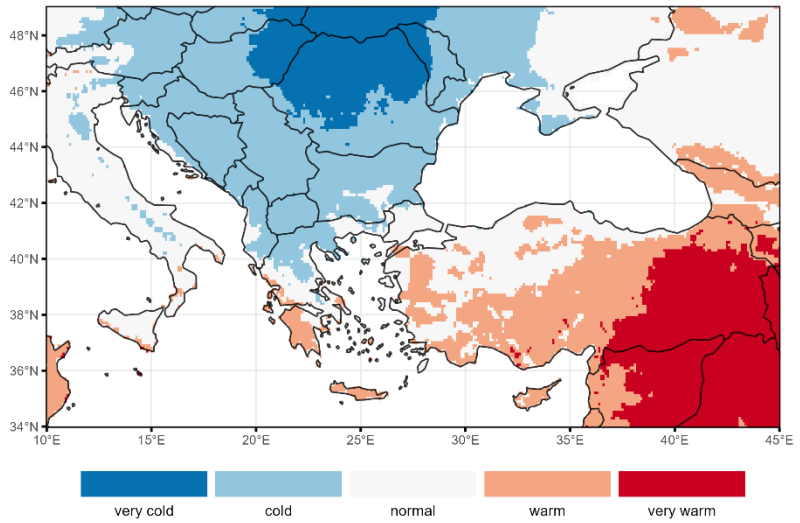
Anomaly of monthly mean temperature (°C), May 2025

Reference period 1991-2020



Monthly mean temperature percentile class, May 2025

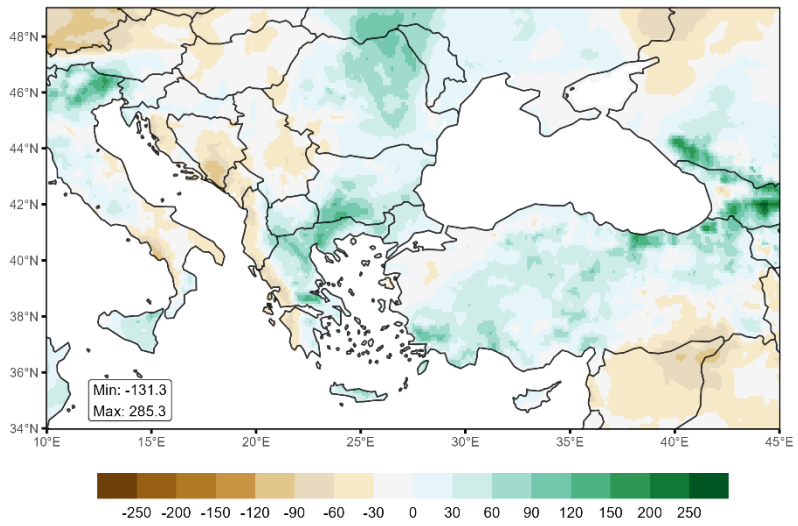
Reference period 1991-2020



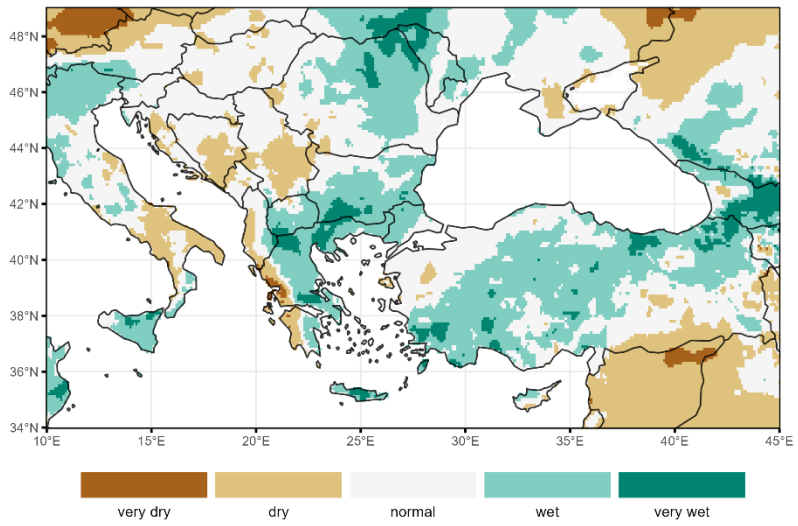
- This May, the region was under an influence of noticeable north-to-south air temperature gradient, as the entire Balkan Peninsula with the exception of Greece experienced unusually cold May, and the rest of Greece and especially Turkey recorded above-average air temperatures this May.
- May was up to 1.5 °C warmer than usual in southern Greece and across northwestern half of Turkey, while over its southeastern half monthly mean stoof 2–3.5 °C above the long-term average, locally up to 4.5 °C, ranking this year's May among the warmest of the local long-term records.
- High air temperatures contributed to unusually high evapotranspiration over southeastern Turkey, increased by up to 30 mm compared to its normal levels for this time of year.

- Similar conditions are revealed by Evaporative Demand Drought Index for May, which also pointed to extremely dry (evaporative) conditions across southwestern part of Greece and entire eastern third of Turkey, where air temperature anomalies were the greastest this May.
- Meanwhile, far northern part of the region stretching from northern Moldova to northeastern Hungary experienced one of the coldest May months of the local records as, averaged over the month, air temperatures were 2.5–3.5 °C below the long-term average, ranking this May among the coldest of the records (<5th percentile). More than 1.5 °C colder than usual was also its wider surrounding area, including the rest of Moldova, Hungary, Romania, and northern Serbia.

Anomaly of 2-monthly surface water balance (mm), May 2025
Reference period 1991-2020



2-monthly surface water balance percentile class, May 2025
Reference period 1991-2020



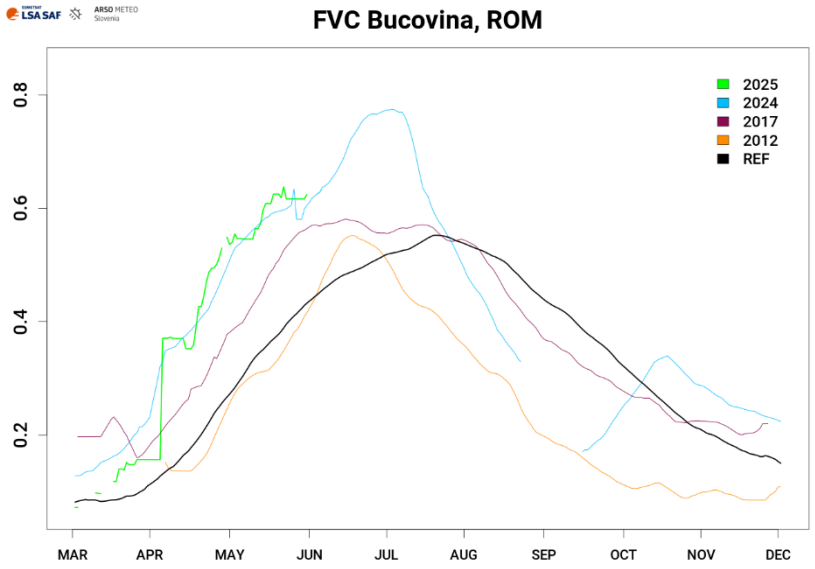
- Almost all parts of the region experienced opposing surface water balance conditions in April as they did in May. Only Aegean Greece, southern Bulgaria, southern north Macedonia and wider central Turkey experienced wetter than normal surface water balance levels in April as well as May, and only localised parts in northwestern Hungary, central Bosnia and Herzegovina, southwestern Greece and southeastern Turkey recorded surface water balance deficit on both months.
- Although April and May had opposing effects on surface water balance conditions across most of the region, the 2-monthly overview reveals southern Bosnia and Herzegovina still ended up with up to 120 mm of surface water balance deficit over the April-May period, and much of northern Hungary, central Serbia and the entire coastal stretch along the Adriatic Sea recorded up to 90 mm of surface water balance deficit, indicating that wetter than usual May did not make up for the deficit experienced during drier than usual April.
- Similarly, two-monthly accumulations show surface water balance surplus of 60–120 mm across northern parts of the region including northern Moldova and northeastern Romania, and between 120 and 200 mm across northeastern Turkey, mostly on the account of much wetter than normal May and April respectively.
- During wetter than normal April as well as May, Aegean Greece accumulated up to 150 mm of surface water balance surplus.
- Elsewhere in the region, accumulated surface water balance ranged mostly about the average or deviated from it for not more than 60 mm.

VEGETATION DEVELOPMENT

Fraction of vegetation cover (FVC) *is a vegetation index based on remote-sensing (satellite) measurements, and shows fraction of the total pixel area covered by green vegetation. As such, it has in combination with atmospheric parameters proved useful also for drought monitoring. Values vary according to the vegetation stage and possible damages, including those by extreme weather conditions. In general, they are low at the beginning of the growing season, highest at full seasonal development, then drop with vegetation senescence. Line shape depends on the sort of vegetation at the given location.*

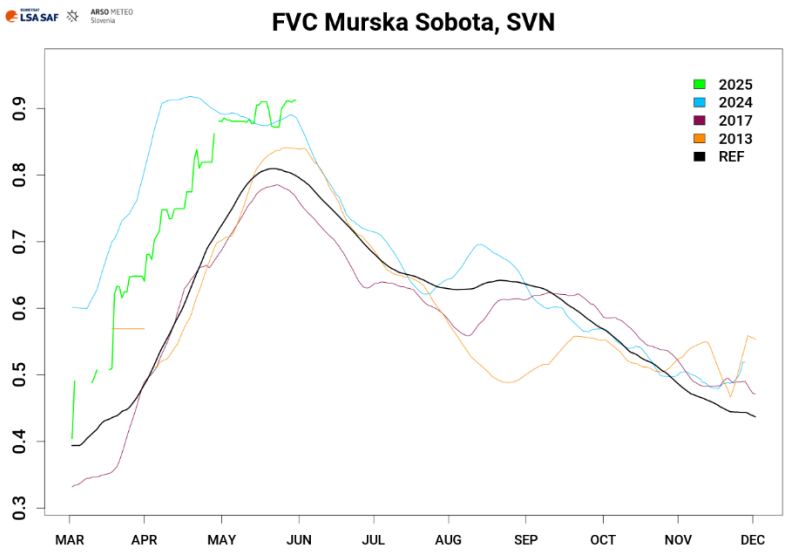
Graphs below show the **fraction of vegetation cover** as recorded **on 31 May 2025** at selected locations across southeastern Europe, with the current year presented in green line. Graphs include also the reference line (long-term average 2004-2024), and lines for the previous year and for drought years 2017 and 2012 (or 2013) for comparison. Missing values or sharp decline can be linked to prolonged cloudy weather, snow cover, extreme weather events, human intervention or changes to product by the product provider.

ROMANIA

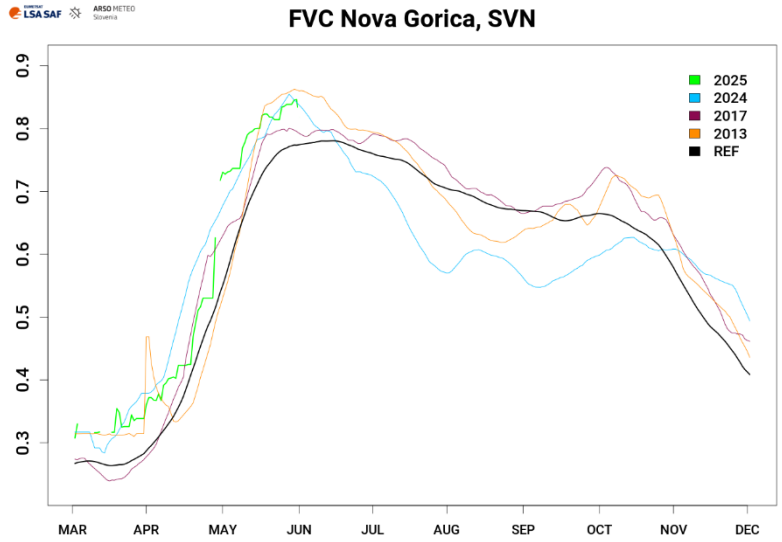


- Vegetation in Bucovina, northern Romania experienced rapid growth and development at the beginning of the season, resulting in covering approximately twice its usual unit of area with green vegetation before mid-April.
- Favourable weather conditions resulted in reaching long-term seasonal peak level of cover before the end of April, with further supporting its growth and development.
- Throughout the rest of spring, vegetation rate of growth sustained up to 20 % greater-than-usual level of cover.

SLOVENIA

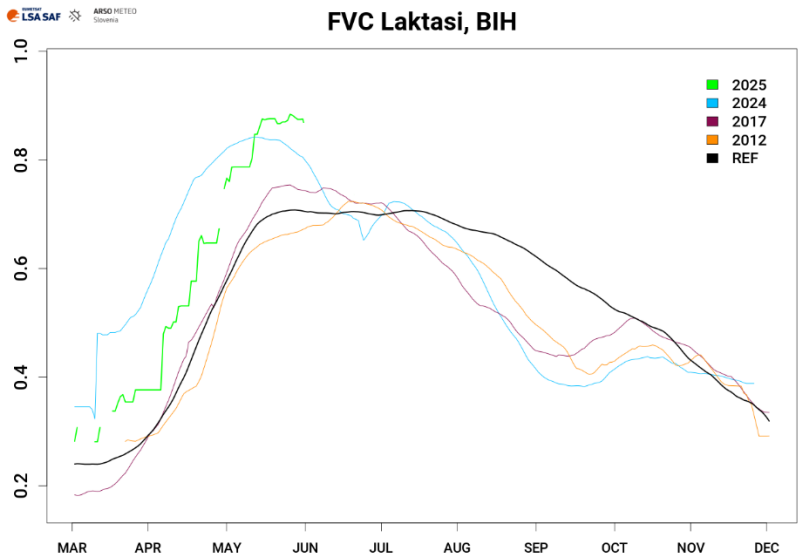


- In Murska Sobota, northeastern Slovenia vegetation season began at its regular time, however, favourable weather conditions of that time boosted vegetation into growth, after which the level of vegetation cover was before the end of March advanced for up to three weeks.
- Vegetation continued to grow and expand at its regular rate of development throughout the rest of spring, meaning it well exceeded the long-term seasonal peak FVC in late May and covered more than 90 % of unit area at the end of spring, about 10 % more than usual.

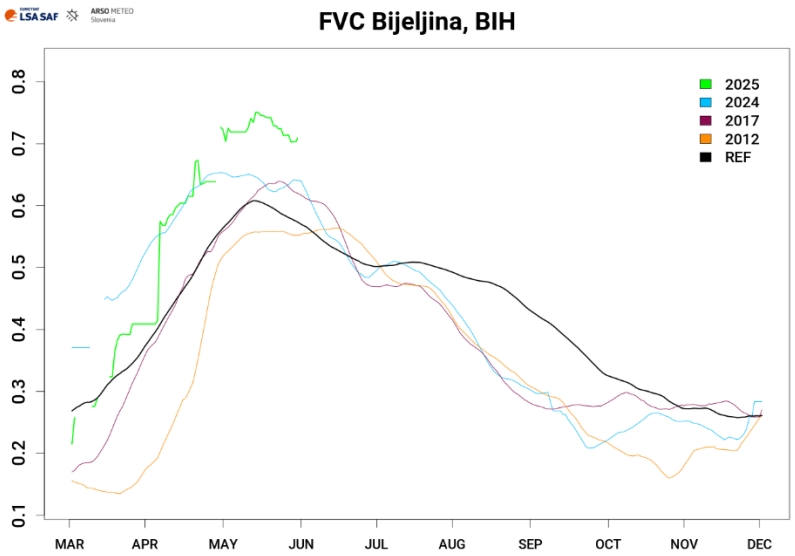


- On the base of slightly higher than normal level of cover, vegetation season in Nova Gorica, western Slovenia began up to two weeks earlier than normal although progressed at the slower than usual rate at the beginning of the season.
- From mid-April onward, vegetation development adopted its regular rate of growth and continued to progress as expected throughout the rest of spring, with slight advancement of vegetation cover.
- Vegetation continued to grow and expand as seasonal peak time approached, ending up exceeding its regular peak extent for this time of the year, covering up to 10 % greater unit of area at the end of May.

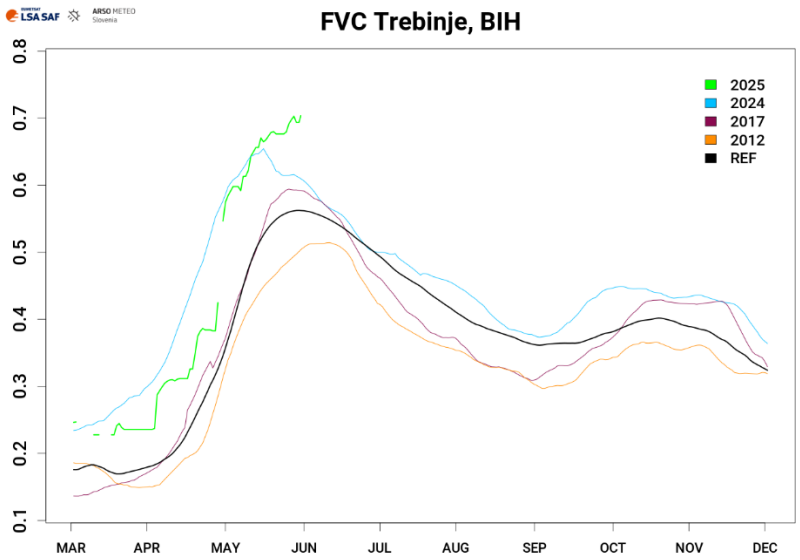
BOSNIA AND HERZEGOVINA (REPUBLIC OF SRPSKA)



- Vegetation in Laktasi, northwestern Bosnia and Herzegovina began its growing season in mid-March, up to two weeks earlier than usual, and progressed at its regular growing rate, meaning it continued to advance in relevant level of cover with green vegetation for the given time of spring.
- Favourable weather conditions supported further growth even at the time of seasonal peak in mid-May, as a result of which vegetation in Laktasi well exceeded its usual seasonal peak. At the end of May when FVC levels began to flatten, it was covering about 20 % greater than normal part of the unit area.

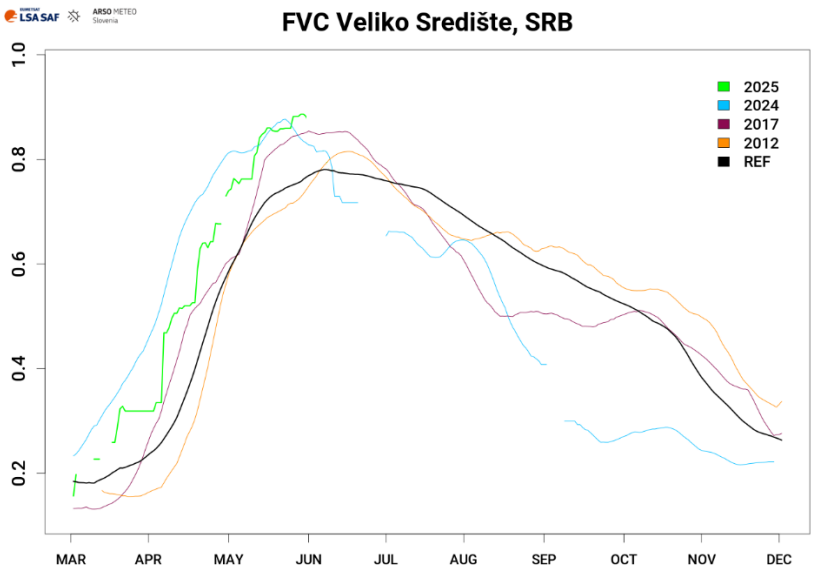


- In Bijeljina, northeastern Bosnia and Herzegovina, vegetation season began as usual although its initial development throughout March progressed at the rate much higher than normal.
- Spring weather conditions proved favourable for vegetation growth and development, as level of cover with green canopy was from late March onward continuously above-average, up to 20 % higher which indicated advancement of about a month.
- Vegetation growth continued up until its regular peak time in mid_may, meaning it exceeded its regular peak level of cover, reaching about 75 %of unit area or approximately 15 % more than usual.
- Declining FVC levels in second half of May indicate the regular onset of the senescence phase.

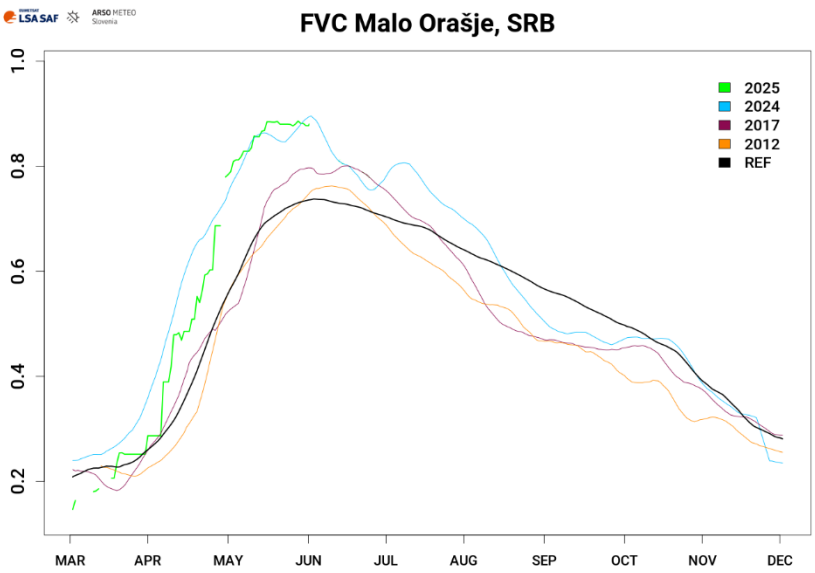


- Vegetation in Trebinje, southern Bosnia and Herzegovina entered the growing season on the base of higher than normal level of cover, but also began its growth up to two weeks earlier than usual.
- April weather conditions hindered vegetation growth which consequently progressed at the slower rate than normal, while in May weather conditions well supported further vegetation development and saw level of cover increase much faster than normal for this time of year.
- At seasonal peak, vegetation was covering about 70 % of unit area, compared to the usual 55 %.

SERBIA

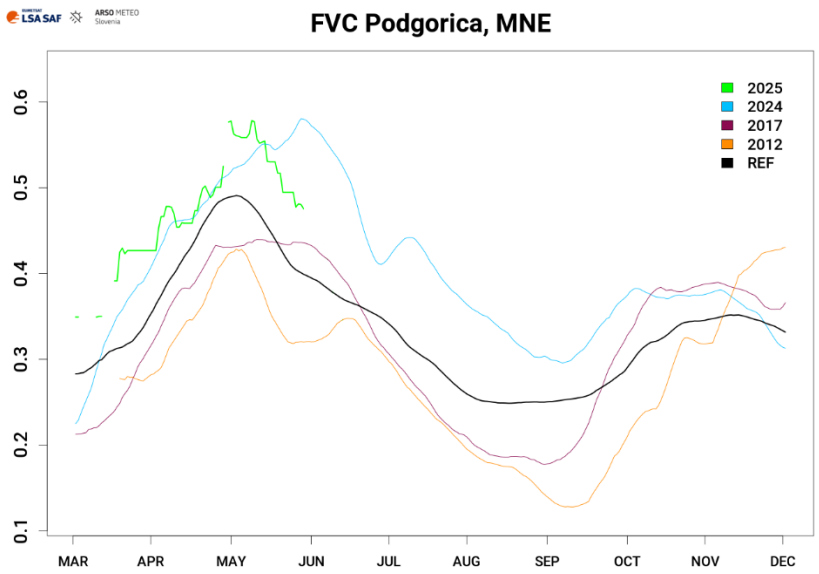


- Vegetation in Veliko Srediste, northeastern Serbia began its growing season earlier than usual, in mid-March already, and overall progressed at the higher rate than usual this spring.
- Fraction of cover with green canopy was throughout all spring advancing its regular levels, as a result of which it exceeded its regular peak level of cover in mid-May, standing at about 90 % at the end of May, which is up to 15 % greater than usual.



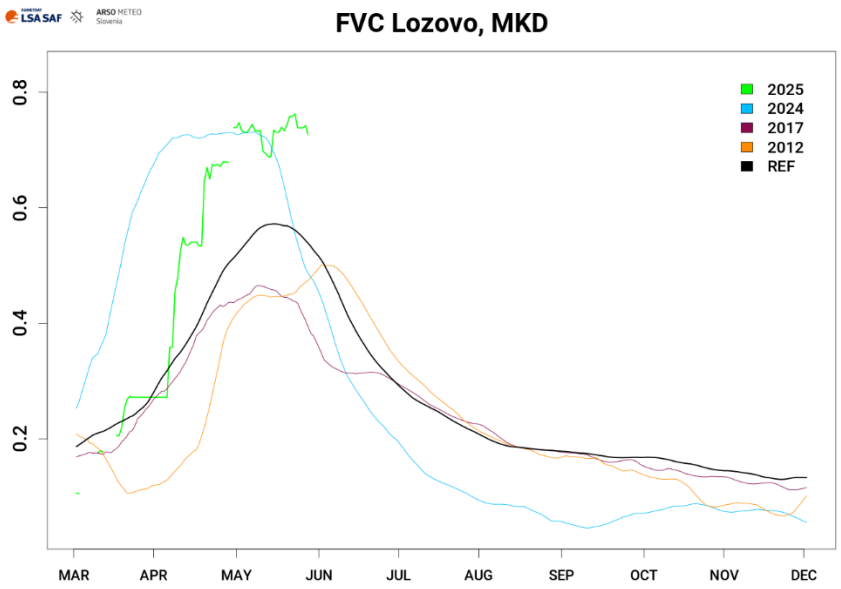
- Vegetation in Malo Orasje, central-eastern Serbia entered spring on the base of lower than normal level of cover but favourable early sping weather conditions well supported vegetation growth.
- Favourable weather conditions further supported vegetation development, which was since early April continuously advanced, and before mid-May exceeded its usual seasonal peak level of cover.
- At the end of May, green canopy was extending across up to 20 % greater than normal unit of area.

MONTENEGRO

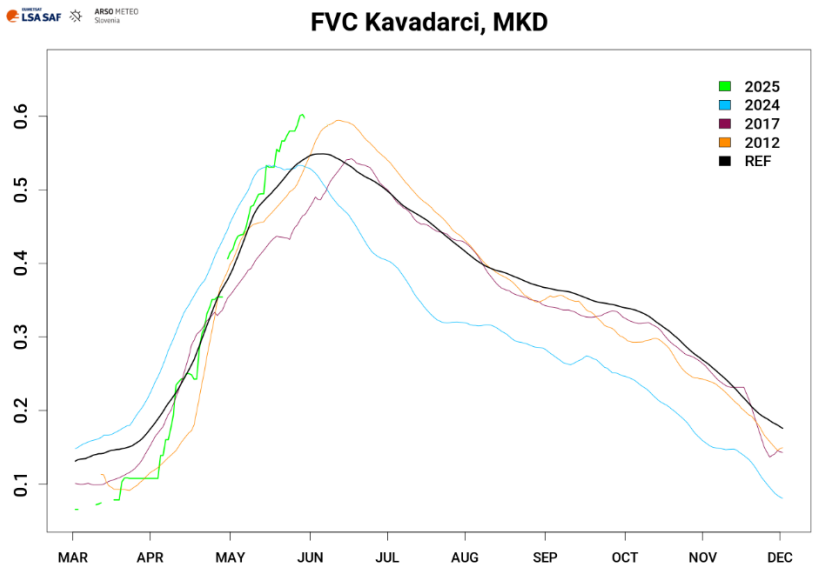


- Although vegetation in Podgorica, southern Montenegro began its growing season on the base of higher than normal vegetation cover, its initial development progressed slower than normal throughout first half of spring.
- At the end of April, just before the usual time of seasonal peak, FVC values were level with average, then May's favourable weather conditions boosted vegetation into growth, which in early May resulted in 10–15 % greater than normal peak extent of green canopy.
- Senescence phase progressed at the regular rate, which on the base of exceeded seasonal peak cover kept FVC levels up to 10 % higher than usual for this time of year.

NORTH MACEDONIA

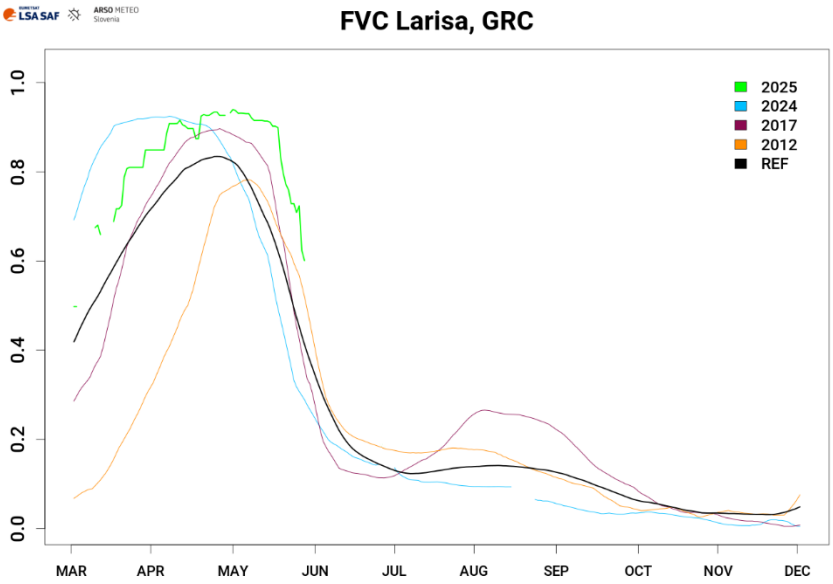


- Entering a new season at the level of cover much lower than normal, vegetation in Lozovo, central North Macedonia experienced a set of boosts in growth which saw vegetation develop at the rate overall much higher than normal.
- By mid-April, almost a month in advance, green canopy was already covering a fraction of area usual at seasonal peak, with weather continuing to support growth throughout the rest of spring.
- Vegettion was in May experiencing a prolongued period of seasonal peak, covering about 20 % greater than usual unit of area.

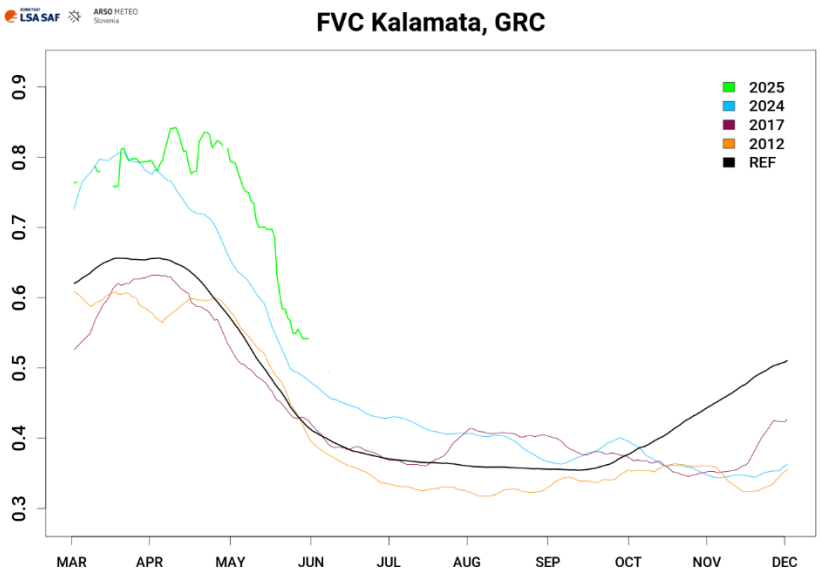


- Similarly as in Lozovo, vegetation season in Kavadarci, southern north Macedonia began on the base of much lower than normal vegetation cover but which especially in early April boosted into growth and development, soon catching up on average levels of cover for that time of year.
- From mid-April onward, weather conditions supported regular vegetation development as it followed well its normal pattern of development.
- Vegetation growth continued also during second half of May when growth normally begins to slow down and reaches seasonal peak, but this year even slightly exceeded it.

GREECE

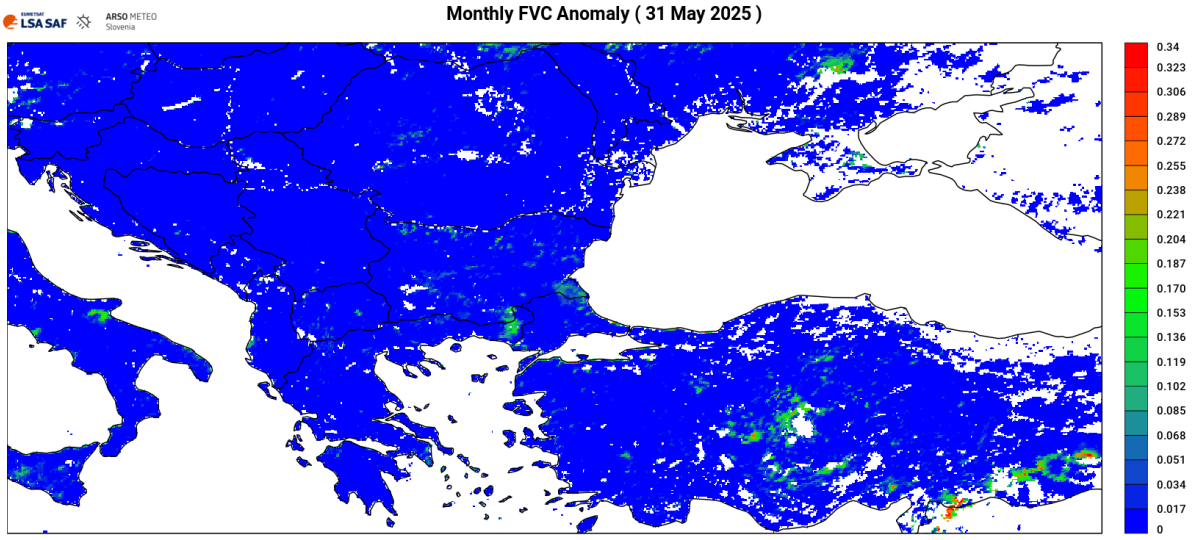


- Vegetation in Larisa, central-eastern Greece experienced above-average growth and development this spring, as level of cover continuously exceeded the average for this time of the year, including reaching about 10 % greater extend at the time of seasonal peak, as well as seeing an extended period of seasonal peak which lasted up to two weeks longer than usual.
- As a result, senescence phase began in mid-May, then progressed at its regular rate throughout May.



- Vegetation in Kalamanta, southern Greece was this year experiencing an abundant growing season, as level of cover was for the whole period of seasonal peak up to 20 % greater than normal, and the peak period lasted 2–3 weeks longer than usual.
- High level of cover lasted for longer period of time, up until late April, postponing the onset of the senescence phase for 2–3 weeks, to early May. Although it then progressed at the higher than normal rate, fraction of cover was at the end of May still up to 15 % above the average.

Figure below shows negative anomaly of **accumulated 30-day FVC** as recorded on **31 May 2025** in comparison to the average of the past 21 years (2004–2024), and is used experimentally.



Overview of the level of cover at the end of May across the region, compared to the end of April conditions, reveal vegetation across much of Balkan Peninsula and mid-western Turkey no longer stay behind the average for this time of the year, but record normal to above-average levels of cover with green canopy. Noticeably lower than normal appear level of cover across far northeastern Greece and in central and across southeastern Turkey where green canopy cover 10–20 % lesser part of unit area, locally up to 35 % less than normal for this time of the year.

DROUGHT IMPACT REPORTS

No drought impacts were reported of across the region.

Methodology

DMCSEE Drought monitoring bulletin is prepared on the basis of climatological reanalysis, remote-sensing data and online media reports. Meteorological variables and indices (air temperature, precipitation, evapotranspiration, surface water balance, SPI, SPEI, EDDI) calculations are based on the European Centre for Medium-Range Weather Forecasts (ECMWF) ERA5-Land monthly averaged data (https://cds.climate.copernicus.eu/datasets/reanalysis-era5-land-monthly-means?tab=overview), using 1991-2020 as a reference period. Remote-sensing product is based on the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Land SAF MSG Daily Fraction of Vegetation Cover [LSA-421] product (https://lsa-saf.eumetsat.int/en/data/products/vegetation/#FVC), presented for the confirmed locations, using long-term averages from 2004 to the last full calendar year (currently up to and including 2024). Information on drought impacts is obtained from freely available online reports of national authorities and media newspapers.