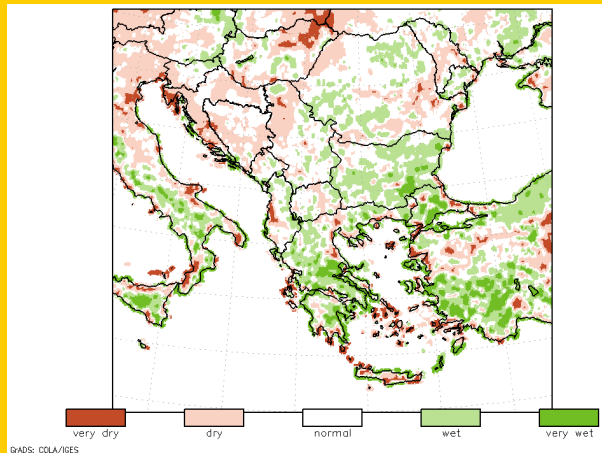


# DROUGHT MONITORING BULLETIN

September 2022

## HOT SPOT

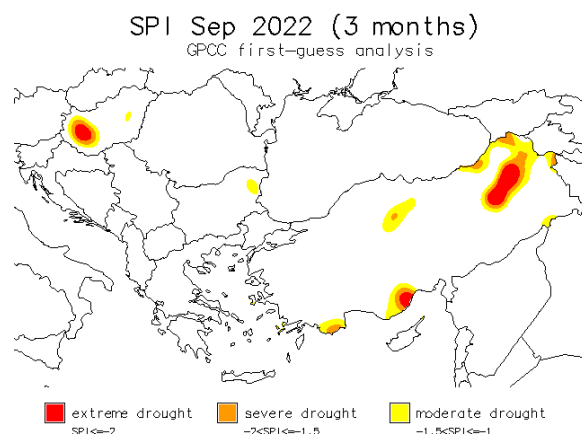
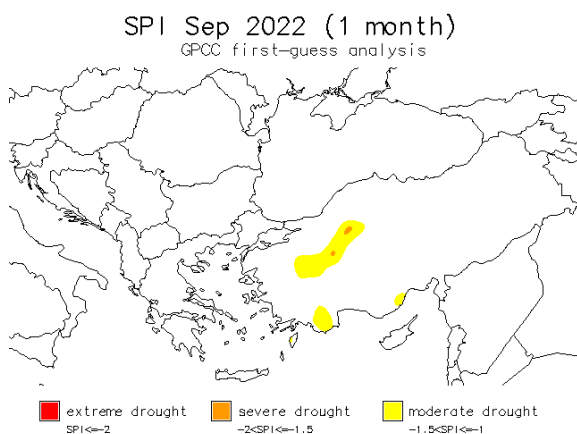


**Accumulated surface water balance between 1 April and 27 September 2022** in percentile classes, shown on the figure on the left, gives first hint of how wet or dry the recent vegetation season was. Northeastern Hungary recorded one of the lowest levels of surface water balance in the last decades, indicating extremely dry warmer half of the year. Most of the northwestern quarter of the region, southeastern Romania, Moldova and central Turkey were this season also left with noticeable surface water balance deficit, indicating dry conditions this season.

## STANDARDIZED PRECIPITATION INDEX

Drought situation with regard to the precipitation level is presented by Standardized Precipitation Index (SPI). The SPI calculation is based on the distribution of precipitation over long time periods (at least 30 years) and can be calculated at various time scales that reflect the impact of drought on the availability of water resources. The long-term precipitation record is fit to a probability distribution, which is then normalised so that the mean (average) SPI for any place and time period is zero. SPI values above zero indicate wetter periods and values less than zero indicate drier periods. Only the dry part of the extreme anomalies is presented on the maps.

Standardized precipitation index for **September 2022** is shown in figures below. SPI for a one-month period indicates possible drought conditions which can have impact on vegetation, while SPI for a three-month period can be indicative also for surface water status.



September was noticeably drier than normal over localised area across central-western Turkey and in its Mediterranean part, where precipitation deficit suggested moderate drought conditions this month. No noticeable deficit was present elsewhere in the region, according to the SPI, where monthly amount of rain either met or exceeded its usual September level. During a 3-month window between July and September, however, precipitation level was well underaverage in western half of Hungary, locally in Mediterranean Turkey and across its northeastern part where lack of rain indicated extremely dry conditions of the past three months. Localised areas of smaller range over southwestern Turkey, in its central part and over coastal Bulgaria also received noticeably lower precipitation amount, indicating mostly moderate drought.

## AIR TEMPERATURE AND SURFACE WATER BALANCE

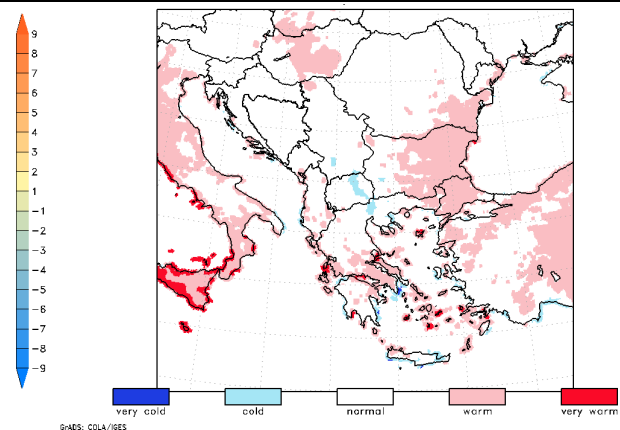
*Figures in this section present anomalies of the average air temperature and accumulated surface water balance as well as their classified values in percentile classes for a 60-day period from 30 July to 27 September 2022.*

AVERAGE AIR TEMPERATURE  
ANOMALY (°C)  
30 JULY – 27 SEPTEMBER 2022



GHRS: COLA/IES

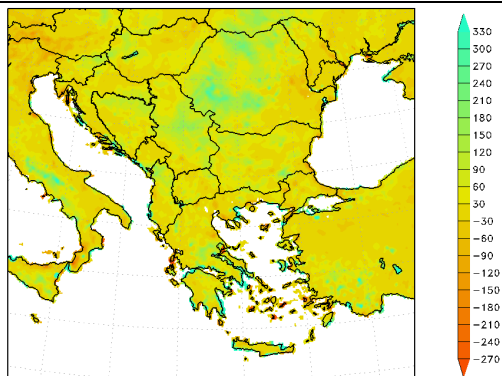
AVERAGE AIR TEMPERATURE  
PERCENTILE CLASSES  
30 JULY – 27 SEPTEMBER 2022



GHRS: COLA/IES

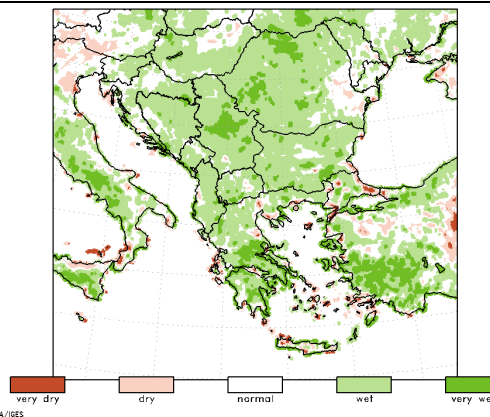
Temperature wise, September could be split into slightly warmer than normal first half and much colder than normal second half of the month. In its first days, it was mostly up to 2 °C warmer than usual over vast part of the region, excluding northeastern Romania, Moldova, central Serbia and continental Greece, over Slovenia and central and northern Turkey mean air temperature rose up to 3 °C above the average. In the remaining days of the first half of the month, up to 2 °C warmer than normal air temperature now spread over southern half of the region, in Greece, Bulgaria and over the Bosphorus Strait they were about 3 °C higher than normal for this time of year. Second half of the month was characterised by the arrival of a much colder than normal air mass which saw mean air temperature drop significantly below the average. The anomalies gradually dropped in the south-east direction, ranging from 4-5 °C colder than normal over much of the northern, western and central Balkan Peninsula and Moldova, to 2-3 °C below the average over Greece, eastern Balkan Peninsula and Turkey. A 60-day mean air temperature over the August-September period averages out the inter-period shifts of warmer- and colder than normal weather, bringing the 60-day mean air temperature to within usual values for this time of year across all of the region.

ACCUMULATED WATER BALANCE  
ANOMALY (mm)  
30 JULY – 27 SEPTEMBER 2022



GHMS: COLA/IGES

ACCUMULATED WATER BALANCE  
PERCENTILE CLASSES  
30 JULY – 27 SEPTEMBER 2022



GHMS: COLA/IGES

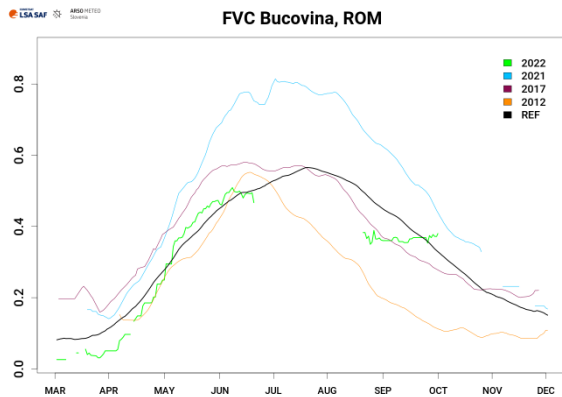
Central part of Balkan Peninsula experienced wetter than normal both August and September, resulting in considerable surplus of 60-day surface water balance over that part of the region. It ranged from 90-120 mm over northern Moldova, northern and eastern Bosnia and Herzegovina, across western half of Bulgaria and western Hungary over to Slovenia, up to 180 mm across central-eastern Greece, northern Albania and across wider central part of Serbia, while greatest anomalies into wet conditions were recorded over Romania with the exception of its southeastern part, where 60-day surface water balance exceeded the usual conditions for up to 240 mm, in its southwestern part more than 300 mm. Elsewhere across the region, 60-day accumulations of surface water balance mostly ended up about the average values, although far northwestern and northern part of the region and central Turkey experienced drier than normal August and wet September. Accumulated deficit was limited to smaller areas of up to -60 mm over northeastern Hungary central Turkey, and of up to -90 mm over northeastern Greece, southeastern Romania and southern Moldova.

## REMOTE SENSING - FRACTION OF VEGETATION COVER

*Fraction of vegetation cover (FVC) is a vegetation index based on multi-channel remote sensing measurements (data from EUMETSAT's LSA SAF data base is used for products in this bulletin). FVC shows fraction of the total pixel area that is covered by green vegetation, which is relevant for applications in agriculture, forestry, environmental management and land use, it has also proved to be useful for drought monitoring. Values vary according to the vegetation stage and to the damages of possible natural disasters (including drought). FVC values are lower at the beginning of the growth season, the highest at the full vegetation development, then FVC slowly drops with vegetation senescence. Line shape depends on the sort of vegetation at the given location.*

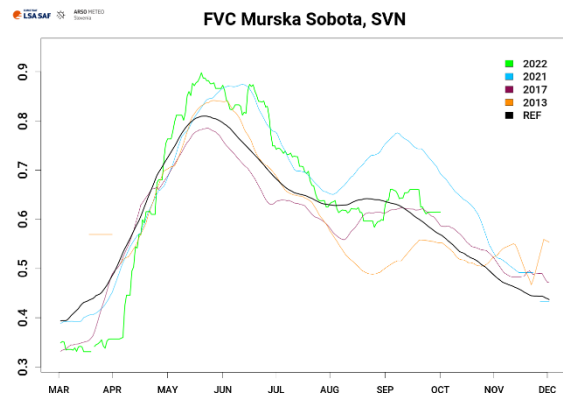
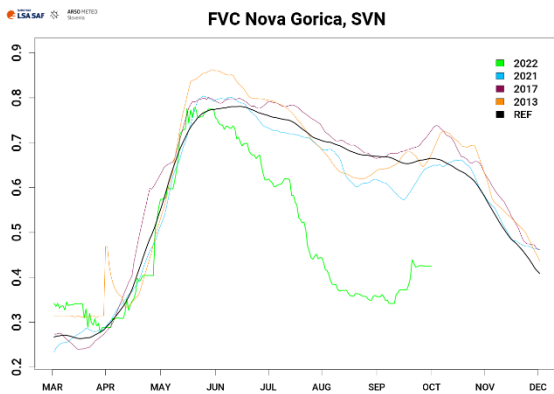
Graphs below present the **vegetation situation** as recorded on **30 September 2022** at selected locations across Southeastern Europe. FVC values for year 2022 are presented as a green line. Graphs also include reference line (2004–2021) in black, and lines in light blue (year 2021), magenta (year 2017) and orange (year 2012, or 2013 for Slovenia) for comparison. Possible missing values or their sharp decline could be a result of a prolonged cloudy weather, extreme weather events, snow blanket or changes to product by product provider.

## ROMANIA



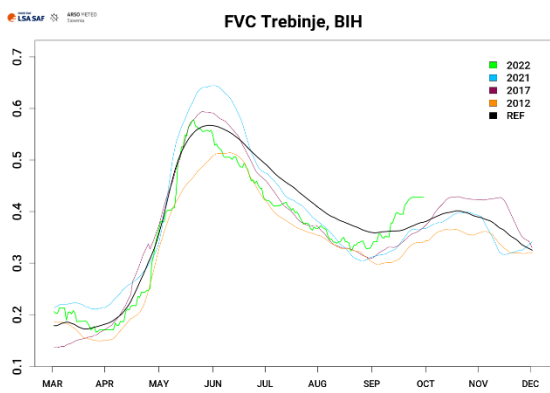
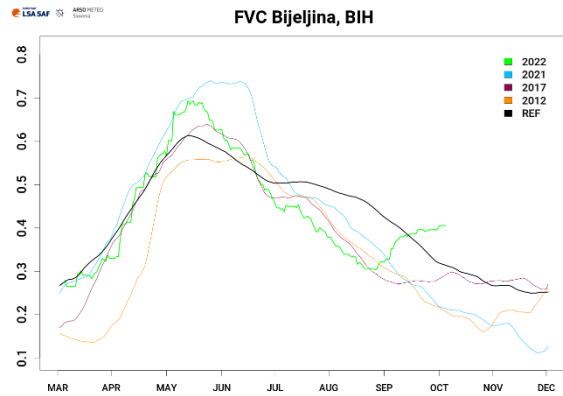
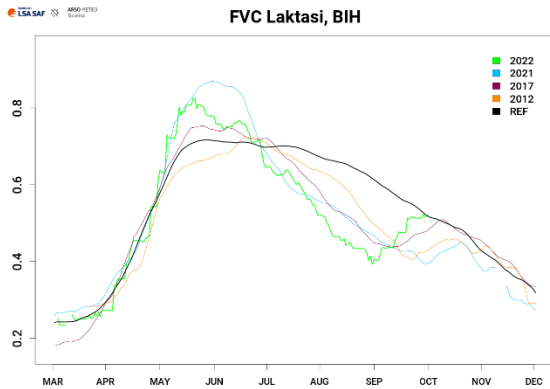
In Bucovina, northern Romania, spring months supported vegetation growth and development as it grew to normal level by early May although it began its growing season from a lower-than-normal level of vegetation cover. Judging from the available FVC values, unfavourable weather conditions during summer months hindered vegetation development, leaving fraction of cover with vegetation 15 % lower than usual in mid-August. Vegetation level has remained constant since then, indicating recovery despite vegetation season coming to an end.

## SLOVENIA



In Nova Gorica, western Slovenia, vegetation development began and progressed as usual during its first months of the season. Since just before reaching its peak, from mid-May onward, weather conditions proved unfavourable for further normal development but instead the level of cover with green vegetation rapidly declined throughout all summer months, stretching over only 35 % of the plot area by the end of August compared to the usual 70 %. The grip of unfavourable weather conditions came to an end in September when vegetation slightly recovered, according to the increase in FVC values for about 10 %. Vegetation growth in Murska Sobota, northeastern Slovenia progressed better than normal in first half of the vegetation season, exceeding its usual peak for 10 % and remaining at the above-average level of cover well into the high summer. Weather conditions proved unfavourable only for a shorter period of time at the end of summer when during August the higher-than-normal rate of senescence brought vegetation cover to the under-average level. Vegetation recovered again throughout September and remained at slightly above-average level by the end of the month.

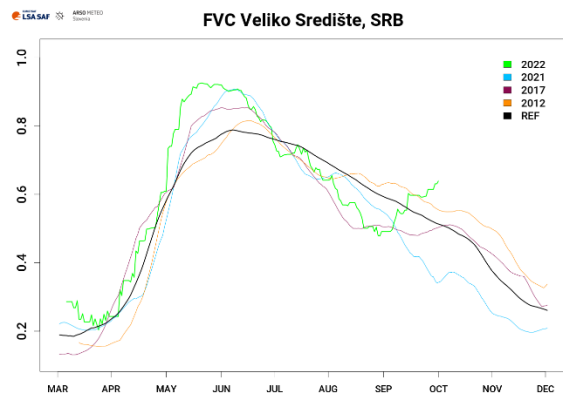
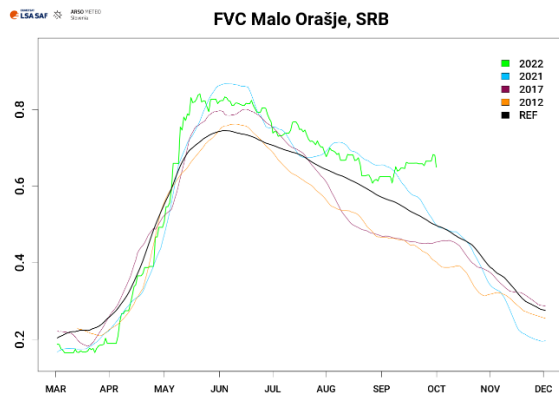
**BOSNIA AND HERZEGOVINA (REPUBLIC OF SRPSKA)**



Vegetation at both locations along northern Bosnia and Herzegovina followed similar pattern of development this season. Spring weather conditions proved favourable for growth and development and even resulted in greater fraction of vegetation cover than normal during its peak period in mid-May. It was followed by a great decline in vegetation cover throughout all summer months, resulting in approximately 20 % lower than normal cover with vegetation by the end of August.

September weather conditions noticeably improved the state of vegetation as increase of about 10 % in FVC values can be observed, restoring the vegetation cover to normal levels again Laktasi, and in greater than normal level in Bijeljina. In Trebinje too in southern Bosnia and Herzegovina, vegetation development progressed well until mid-May, just before its peak time. May weather conditions triggered early beginning of senescence phase, which progressed at its usual rate throughout summer months. During September, increase in FVC values by up to 15 % indicates some recovery of vegetation cover in final part of the season.

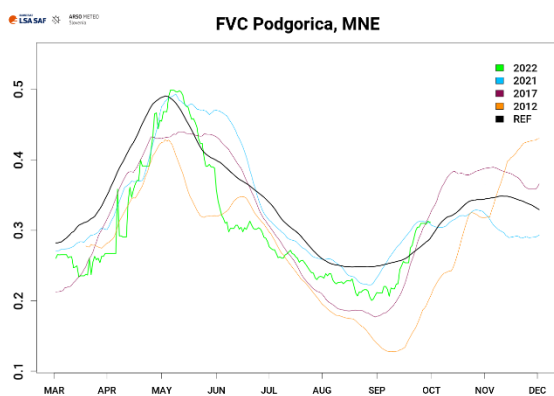
**SERBIA**



Vegetation season began slightly later than normal in Malo Orašje, central Serbia and developed at its usual rate throughout spring months. Vegetation development continued well also into its peak period, exceeding the average cover for approximately 10 %. Summer weather conditions

appear to support regular senescence process as FVC values declined at the more or less usual rate throughout summer months. September brought some boost in vegetation growth unusual for this vegetation type and location, with increase in fraction of cover with vegetation for approximately 10 % throughout September. In veliko Srediste, northeastern Serbia, vegetation development progressed well in spring months, at slightly higher rate than normal and also exceeded the peak cover for up to 15 % at the end of spring. Summer weather conditions sped up the rate of senescence phase throughout summer months, during which saw a decline in vegetation cover fall for 45 % instead of the usual 20 %. In Veliko Srediste too, vegetation growth began again in September, with an increase of vegetation cover for approximately 15 %.

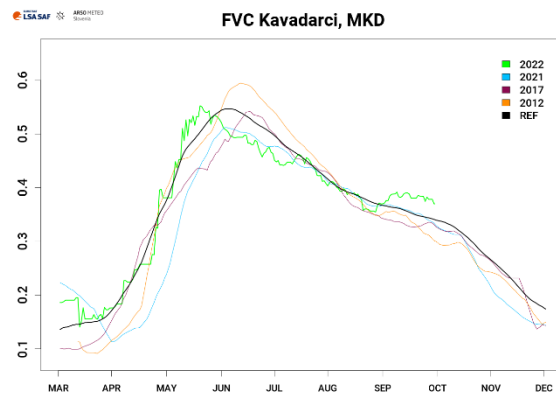
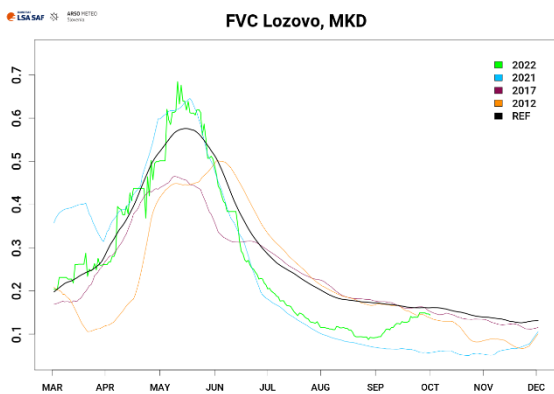
### MONTENEGRO



In Podgorica, southern Montenegro vegetation season began later than usual and progressed well in its first part of the season, reaching usual level of cover at its peak in early May. Weather conditions of the following months did not prove favourable for the usual progress of senescence phase, as instead it occurred at the higher rate than normal, with the greatest decline throughout May when fraction of vegetation cover dropped by more than 20 %, with additional drop of 10 % in fraction of cover by the end of August. By that time, FVC

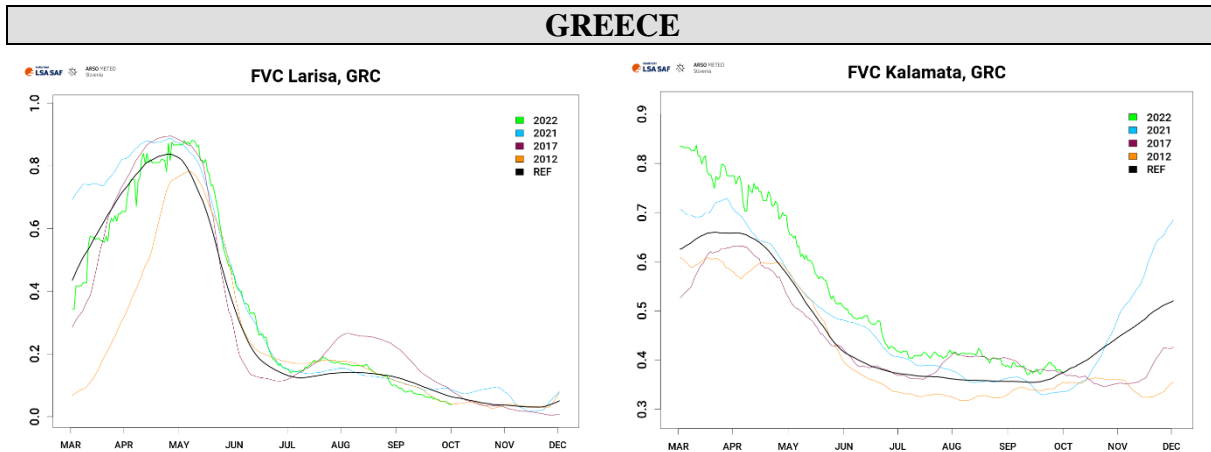
values stood below the average, however, fraction of cover with vegetation increased faster than normal throughout September, standing slightly above-average by the end of the month.

### NORTH MACEDONIA



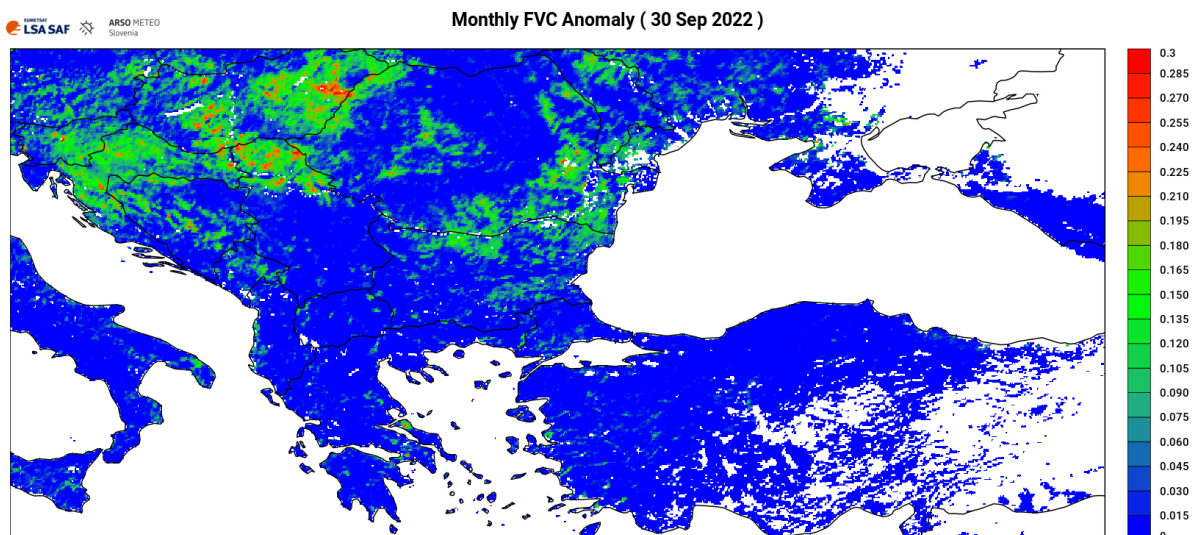
At both locations in North Macedonia, vegetation season as usual and vegetation growth followed well its usual pattern of development until mid-May when peak of the season approached. It was well exceeded in Lozovo, central part of North Macedonia, for 10-15 %, however, followed by a greater than normal rate of senescence during summer months. The negative deviation from the usual fraction of cover with vegetation continued to grow throughout summer, ending up at half of its usual level by the end of August. September saw some increase in vegetation cover, restoring it almost to its usual level at that time of year. Vegetation in Kavadarci in southern part of the country did not experience such rapid decline in vegetation cover after its peak period despite the fact that senescence phase began earlier

than normal. The rate of decline in fraction of vegetation cover was milder than normal throughout summer months, resulting in no great deviation from the usual by the end of August. At this location too, September proved favourable for vegetation growth as FVC values increased to above-average by the end of the month.



Vegetation season began slightly later than normal in Larisa, central-eastern Greece, with this delay present throughout most of the season, according to FVC. Weather conditions proved favourable for vegetation growth in its first part as it exceeded its usual fraction of cover with vegetation at its seasonal peak. Early July saw increased growth at the beginning of its second growth of the season, however the growth soon came to an end and decline in fraction of vegetation cover can be observed since mid-July, similar as in 2012. Under-average FVC values remained also throughout September. On the other hand, it was altogether a well above average vegetation season in Kalamata, southern Greece. Fraction of cover with vegetation was almost a third greater than normal at the beginning of March and remained above-average throughout the rest of the season, progressing at its usual rate of senescence and dormancy.

Figure below shows negative anomaly of **accumulated 30-day FVC values** as recorded on **30 September 2022** in comparison to the past 18 years (2004-2021), and is used experimentally.



With the exception of the Carpathian mountain chain, fraction of cover with healthy vegetation at the end of September appear to be noticeably reduced across majority of the northern half of Balkan Peninsula, according to FVC. Vast area stretching across Hungary, Slovenia, Croatia and northern Serbia but also in central, southern and eastern part of Romania, Moldova and along northern Bulgaria appeared to have up to 20 % reduced fraction of cover with vegetation in comparison to the average for this time of year, in eastern Hungary up to 30 %. Some scattered, localised areas within that part of the region also record higher accumulated deficit and hereby affected vegetation, most notably in western Hungary and northern Serbia, although their appearance suggests various background reasons.

## DROUGHT IMPACT REPORTS

### HUNGARY

According to the National Water Directorate General, this year's drought was very severe but not considered extraordinary: droughts of similar severity occur in Hungary every 20-50 years, but analysis show this year's drought can be considered the most serious of the 21<sup>st</sup> century. On the Danube, the Tisza and the Drava rivers, the spring flood wave was missed, and extremely low water levels and water flows were experienced on all three rivers. As a result of the drought, more than a fifth of domestic farmland simply dried up, according to the Ministry of Agriculture. In the case of sunflower, the crop loss is approximately 50 % <sup>[1, 2]</sup>.

According to the report of the National Statistics Office, this year the amount of winter wheat harvested from the entire wheat harvest was 21 % behind 2021 and the average of the previous five years. Compared to the previous year, the average yield of rye, oats and triticale showed a decrease of 9, 22 and 24 %, respectively. Both in terms of quantity and proportions, Jasz-Nagykun-Szolnok County in central-eastern Hungary faced the worst, where the harvest volume was essentially halved, even though the area of harvested wheat increased by 16 %, even higher than the national average <sup>[3]</sup>.

As for the corn crop, due to the severe drought and heat waves, hundreds of thousands of hectares of corn were destroyed, and part of the withered plant could only be used as fodder. Maize remained in the eastern part of the country and in the Transdanubia region, but even there it yielded low-quality crops. According to the most optimal estimates, domestic needs will not be served in full by this year's crop, and import in an unprecedented way is unavoidable. This has never been seen before for Hungary, every year agriculture produced far more than domestic needs, and a significant export base of several million tons used to be created. According to the forecasts of the market participants, a harvest of 2.8-3.6 mio tons of corn can be expected this year instead of the usual 6-9 mio tons. The domestic consumption of corn for food, fodder, and industrial purposes is 4-5 mio tons per year, which means that we may need to import up to 2 mio tons <sup>[4]</sup>.

In the Kunsag wine region, southern Hungary, the harvest done so far suggests the producers were able to harvest fewer amounts than last year, which was already below-average due to the drought. The average losses due to drought were smaller than initially expected although at the same time some areas bore practically no harvest, as some plantations were completely destroyed <sup>[5]</sup>.

During drought that hit Hungary this year, the water level of surface streams and rivers decreased significantly throughout the country. In mid-August, the water level of the Lazberci reservoir in northeastern Hungary, considered as a drinking water base, also started to drop



significantly. The summer heat wave did not spare Tapio river either, which completely dried up at Jaszboldoghaza in central Hungary, which occurred for the first time in history. The animal life along the stream disappeared, the grassland was burned. The area had not experienced such a drought since human history<sup>[6]</sup>. Despite a large amount of precipitation in September, the water level of Lake Balaton was still extremely low. It gives an idea of how dried the surrounding land was as it is typical that the precipitation is absorbed by the soil and the plants with great intensity after the dry summer. Similar situation remains at the end of September for Lake Velencei, central Hungary. There was no water in its catchment area either, meaning the water level cannot be increased by inflow but it depends only on effective precipitations<sup>[7, 8]</sup>.

[1] <https://www.atv.hu/belfold/20220915/vizugy-sulyos-volt-az-idei-aszaly-de-nem-rendkivuli>

[2] <https://www.atv.hu/belfold/20220915/agrarminiszter-a-hazai-termofoldek-tobb-mint-otode-egyszeruen-kiszaradt>

[3] [https://nepszava.hu/3171524\\_foldgaz-gazolaj-ipari-fogyasztok-dizelhiany-mol](https://nepszava.hu/3171524_foldgaz-gazolaj-ipari-fogyasztok-dizelhiany-mol)

[4] <https://index.hu/belfold/2022/09/17/importra-szorulunk-kukoricabol/>

[5] <https://magyarnemzet.hu/gazdasag/2022/10/az-aszaly-miatt-a-bor-ara-is-meg-fog-ugrani>

[6] <https://index.hu/belfold/2022/09/19/to-kiszaradt-halpusztulas-titkos-to/>

[7] <https://www.atv.hu/video/20220930/a-sok-csapadek-ellenere-tovabbra-is-alacsony-a-balaton-vizszintje>

[8] <https://magyarnemzet.hu/brand/orszagszerte/2022/09/miert-nem-emelkedik-a-velencei-to-szintje>

## SLOVENIA

This year is likely to be one of the driest in Slovenia's recorded history. Farmers felt the lack of rain in spring already, and even winter was unusually dry. This year's drought ranks as similar to the one in 2003 and is likely to surpass the economic losses in agriculture experienced in 2003. Of agricultural crops, most affected this year were silage corn and permanent grasslands. First estimates of the corn harvest indicate losses of between 40-60% on average, especially on shallow soils where they may be as high as 80 %<sup>[1, 2, 3, 4]</sup>. Most farms produced only half as much hay as they would under normal conditions. Instead of the usual three to four mowing cuts per season, most farms collected poorer first cut, heavily reduced second cut while there was no third cut at all due to no precipitations and extremely high air temperatures. Yield of stubble crops was also lower than last year, according to the Statistics Office. Potato yield is also expected to be reduced, compared to last year. In Gorenjska region, northwestern Slovenia potato yield on rainfed plots is expected to be reduced by 35-60 %, and the quality of the harvest will also be worse, which is expected to further affect purchase prices. Vegetables on plots without irrigation will be reduced by up to 90 %<sup>[4, 5]</sup>.

Reduced corn and hay harvest is of greatest concern for livestock farmers. In addition to lesser hay harvest, quantity as well as quality of the corn harvest is catastrophic and puts livestock feeding until the next harvest at risk. According to the Chamber of Agriculture and Forestry of Slovenia, the price of animal feed on world markets almost doubled already. Some farmers will be forced to sell their animals, while market-oriented farms who cannot afford that are likely to face buying expensive feed, thus their products will be even more expensive<sup>[4, 6, 7]</sup>.

In eastern Slovenia, grape harvest began in late August, earlier than normal due to drought, with yields estimated to be a third lower than usual, in some places even halved<sup>[8]</sup>. Olive harvest was also affected by drought as this year, the amount of olive harvest is well under-average. The oil content in the fruits remain high and the oil will be specifically bitter<sup>[9]</sup>.

Spruce trees have noticeably weakened due to scorching heat and drought this year, which also accelerated progression of bark beetle in spruce forests. According to the Slovenia Forest Service, worst situation was observed in Crna na Koroskem and Upper Savinja valley in the country's north-east, in Gorenjska region in the north-west and in Kocevka region in southeastern Slovenia<sup>[10]</sup>.

Hydrological drought negatively affected river ecosystems and caused great economic losses also in fish farms. Due to drought-related fish death and disease outbreaks, as well as in loss of numbers of feed days, economic losses are estimated at around half a million EUR, according to the Chamber of Agriculture and Forestry Slovenia <sup>[11]</sup>.

In mid-September, Loska valley in southern Slovenia faced severe shortages of drinking water, as the primary source dried up due to drought in July already, and the secondary dried up in just three days. Drinking water was delivered to the region from regional capital Postojna town, according to the Administration for the Civil Protection and Disaster Relief <sup>[12]</sup>. Water shortages due to lack of precipitations were a severe problem also for mountain huts, mostly in the high mountains whose water supply relies entirely on rainwater. Many mountain huts had no water to offer for either food and drinking consumptions or sanitary needs <sup>[13, 14]</sup>.

[1] <https://vecer.com/slovenija/tako-hude-suse-ni-bilo-ze-od-leta-2003-letosnja-letina-koruze-bo-katastrofalna-10297469>

[2] <https://www.dnevnik.si/1042999567/slovenija/neuradno-zaradi-suse-162-milijonov-evrov-skode>

[3] <https://sta.si/3084397/po-ocenah-panvite-letina-koruze-katastrofalna?q=su%C5%A1>

[4] <https://www.gorenjskiiglas.si/apps/pbcs.dll/article?AID=/20220810/C/220819989/&template=printart>

[5] <https://sta.si/3086439/letos-pridelanega-manj-zita-marelice-in-cesnje-obrodile-odlicno>

[6] <https://vecer.com/slovenija/zaradi-manjsega-pridelka-koruze-v-stiski-zivinorejci-10297803>

[7] <https://www.delo.si/novice/okolje/pomanjkanje-krme-prazni-hleve-rejcev-govedi/>

[8] <https://sta.si/3075571/tudi-vinogradniki-na-vzhodu-drzave-pohiteli-s-trganjem?q=su%C5%A1>

[9] <https://sta.si/3087373/obiranje-izolske-oljke-zupanov-kot-napoved-skromnejse-letine>

[10] <https://vecer.com/koroska/zaradi-suse-smreke-ogrozene-od-podlubnikov-kje-na-koroskem-je-najhuje-10296524>

[11] <https://sta.si/3075897/susa-povzrocila-veliko-gospodarsko-skodo-tudi-ribogojcem?q=su%C5%A1>

[12] <https://sta.si/3080712/v-loski-dolini-hudo-pomanjkanje-pitne-vode?q=su%C5%A1>

[13] <https://www.rtvsl.si/zabava-in-slog/ture-avanture/naj-planinski-koci-2022-krekova-koca-na-ratitovcu-in-mihov-dom-na-vrsicu/639440>

[14] <https://www.pzs.si/novice.php?pid=15962>

## ROMANIA

As for the agriculture, most impacted remain corn and wheat yields. The heat dried the fields too early, so the harvest began two weeks earlier. Maize, which was supposed to be harvested from September onwards, is already being harvested before the end of August <sup>[1]</sup>. According to the Ministry of Agriculture, by the first week of September 470,000 ha of agricultural land was reported affected by drought, of which slightly less than a half presented wheat plots, almost a quarter corn plots, followed by sunflower, other cereals and about one eighth being rapeseed plots <sup>[2]</sup>.

Six lakes in Danube Delta have completely dried up, and dozens more were on the verge of disappearance. Instead of waterholes where the fauna and flora of the reserve thrived and used to attract thousands of tourists, there can only be kilometers of dry land seen, and the fish in danger of suffocating. The most affected are the lakes near town Tulcea. Instead of lakes, flocks of birds, fish and vegetation, whole hectares of dryness appeared <sup>[3]</sup>. The water in Lake Techirghiol, the largest salt lake in Romania, dried up over a considerable portion of area and was close to disappearance. From above, the landscape looked desolate. It dried up for a distance of at least 50 m from its original shore. The lake was over seven and a half kilometers long and nine meters deep. Normally, the water level should reach the pontoon but the entire shore of Lake Techirghiol was dry, and the boat was left stuck in the mud. As the area is considered a natural site, people cannot intervene. There was also less mud famous for its therapeutic properties, which could also be reflected in the price of the therapies <sup>[4]</sup>.

[1] <https://stirileprotv.ro/stiri/actualitate/seceta-a-facut-ravagii-in-agricultura-din-romania-daea-zschimbarile-climatice-sunt-o-realitate.html>

[2] <https://agrointel.ro/233998/suprafata-de-culturi-calamitate-de-seceta-raportarile-madr-indica-aproape-470-000-ha-afectate/>

[3] <https://stirileprotv.ro/stiri/actualitate/dezastru-in-delta-dunarii-sase-lacuri-au-secat-complet-iar-alte-zeci-sunt-pe-cale-de-disparitie.html>

[4] <https://stirileprotv.ro/stiri/actualitate/lacul-techirghiol-este-pe-cale-de-disparitie-apa-a-secat-pe-o-portiune-considerabila.html>

## MONTENEGRO

Negative impact of drought was decreasing during September. Its effects on nature and society were less than in previous months. Based on drought monitoring and analysis of the SPI index, drought watch tool and precipitation analysis, it can be said that during and at the end of September the **agricultural drought** ended in all parts of Montenegro. The total amount of rainfall was above average, the moisture content in the soil increased. However, the end of the drought in September came too late for most agricultural crops and the damage it caused in the past period was irreparable.

The **hydrological drought** did not end in September, but was only decreasing in intensity. Groundwater levels, the recharge of which is a prerequisite for surface water to appear, were still low, so the hydropower sector was still significantly affected. According to information from the Electric Power Company of Montenegro (EPCG), the energy situation did not significantly improve until the end of September, as the inflows on the rivers and the levels of the Perucica hydroelectric power plant (HE) reservoirs were low. The rainfall in the territory of Niksic (central region with artificial accumulation of lakes) was about 46 % higher than the average, the inflow of the Zeta river "was at zero", while the inflow of the Piva improved somewhat. Although the hydrological drought had a tendency to weaken, the reduction of its negative impact is expected only in the coming months if the amount of rainfall is the same as in September.

The last major forest fire occurred in the vicinity of Ulcinj, on the Pinjes hill, where **a large area of pine forest burned**. The fire was under control on 21 September by coping from the ground and from the air, but it was completely extinguished on 23 September.





*Photo 1: Slano Lake (artificial lake, for HPP “Perucica”). Source: Mirjana Ivanov, 6 September 2022*



*Photo 2: Lake Moraca (Podgorica, near Millennium Bridge). Source: Mirjana Ivanov, 13 September 2022*



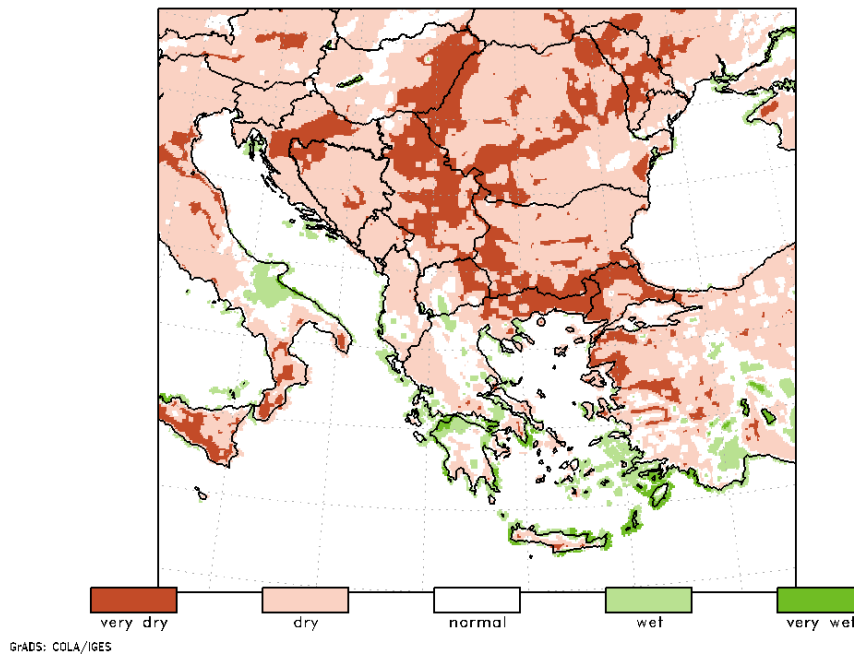
*Photo 3: Crno Lake, Durmitor National Park. Source: Danijela Minić, 18 September 2022*

Extracted from:

- [1] <https://www.vijesti.me/vijesti/drustvo/622889/vazduhoplovci-vcg-lokalizovali-veliki-pozar-u-okolini-ulcinja>
- [2] <https://jadranovi.me/vijesti/ekonomija/i-dalje-nedovoljno-kise-za-struju-iz-he/>
- [3] <https://pogled.me/djukanovic-veca-cijena-struje-ne-rjesava-probleme-epcg-a-stvara-ih-gradjanima/>
- [4] <https://www.cdm.me/ekonomija/kisa-nije-popravila-energetsku-situaciju/>

## OUTLOOK

Figure below presents model simulations of the **60-day accumulated surface water balance anomaly** in historical percentile classes for the time period from **28 September to 26 November 2022**, as seen in Drought Watch tool<sup>1</sup>.



The outlook of the 60-day accumulated surface water balance gives a sign of a dry to very dry time period covering mainly October and November across nearly the entire region. Only its southernmost parts, namely local parts of the coastal Greece and southwestern Turkey, will be experiencing normal to wet surface water balance conditions. Most of the central to southeastern Balkan Peninsula, across central Romania to Moldova and over a localised area between Croatia and north Bosnia and Herzegovina, October to November period will end up with extreme deficit in surface water balance compared to the long term average of this time of year, among the driest 5 % of historic records.

### Methodology

DMCSEE Drought monitoring bulletin is based on numerical weather prediction (NWP) model simulations over SE Europe, SPI index calculations, remote sensing product and public media drought impact reports. Precipitation data is provided by Global Precipitation Climatology Centre (GPCC; <https://www.dwd.de/EN/ourservices/gpcc/gpcc.html>) shown against the average of the 1961-1990 time period. NWP simulations are performed with Non-hydrostatic Mesoscale Model at ~7 km spatial resolution (NMM; <http://www.dtcenter.org/wrf-nmm/users/>). Historical model climatology in terms of air temperature and surface water balance is computed with NMM on the base of 1 January 1991 to 31 December 2020 time period, using European Centre for Medium Range Weather Forecast (ECMWF) ERA5 dataset (<http://www.ecmwf.int/en/forecasts/datasets/reanalyses-datasets/era5>) as input for simulations. Long-term averages (1991-2020), used for comparison of current weather conditions, are obtained from simulated dataset. Comparison of current values against long-term average or in percentile classes (the two extreme classes with a 5-percent range and each of the middle three classes with a 30-percent range) provides a signal on potentially ongoing drought. Remote-sensing product in the bulletin is based on the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) Land SAF MSG Daily Fraction of Vegetation Cover product (<https://landsaf.ipma.pt/en/products/vegetation/fvc/>), presented for the checked and confirmed locations and using long-term averages from 2004 to the last full year (currently to 2021). Information on drought impacts are obtained from freely available online reports of national authorities and media newspapers.