



DROUGHT MONITORING BULLETIN

2024 April

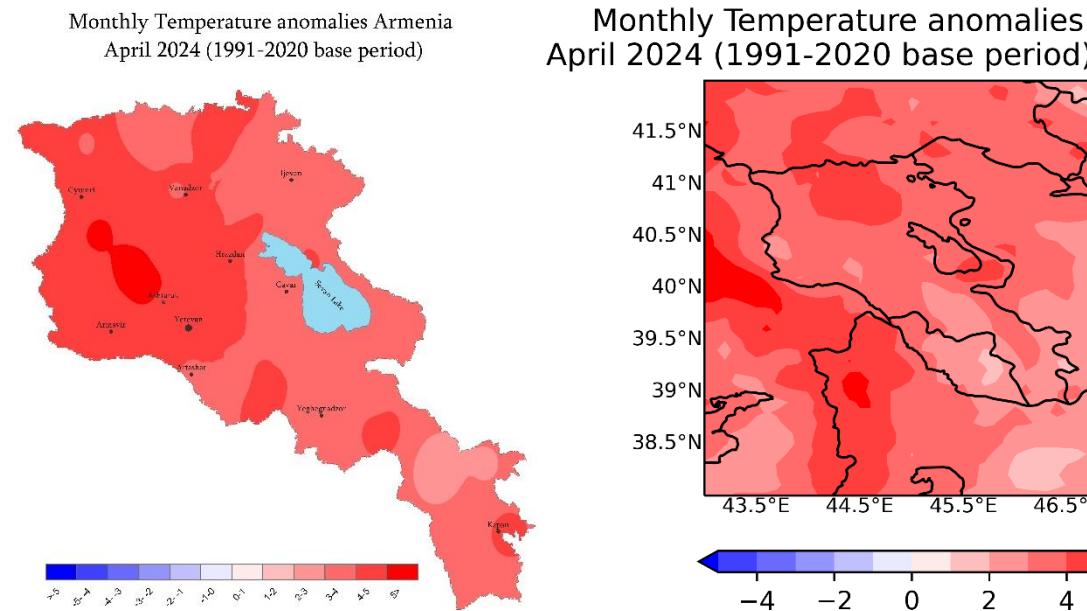
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1. Monthly temperature anomaly

April 2024 was considered as the warmest April since 1935. The average air temperatures throughout the country were 2-4°C higher than normal. According to the observations of 43 meteorological stations in Armenia, temperature deviations reached to 5 °C at some stations.

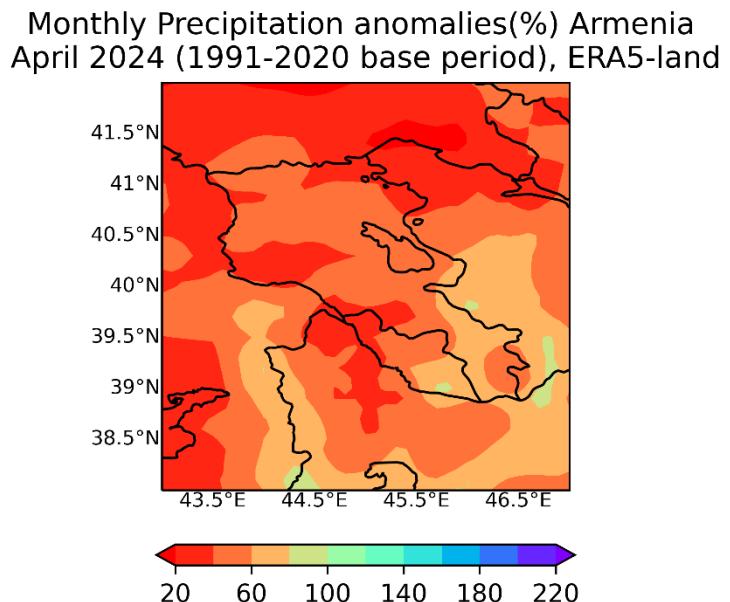
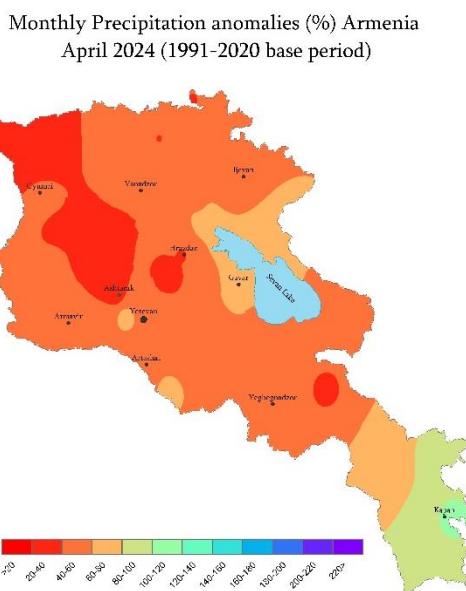
The map of average monthly temperature deviations from the ERA5-Land global reanalysis reflects quite well the positive deviations of April temperatures over the territory of Armenia.



2. Monthly precipitation anomaly

The high temperatures in the Republic were accompanied by low precipitation in April. Only 20-40% of precipitation norms were observed in most part of Armenia. The warmest April was the driest for Armenia at the same time.

The ERA5-Land reanalysis realistically reflects the lower rainfall in Armenia since the norm in April.

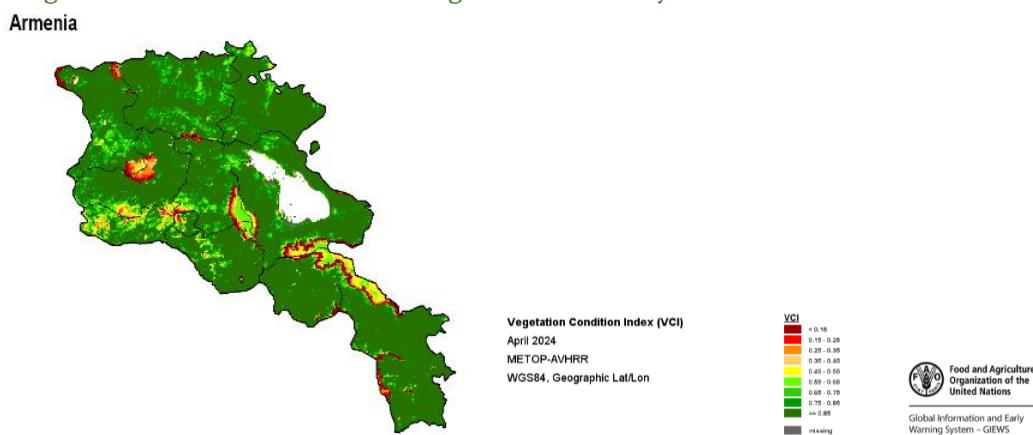


3. Drought indices

3.1 Vegetation Condition Index (VCI)

The Vegetation Condition Index (VCI) compares the current NDVI to the range of values observed in the same period in previous years. The VCI is expressed in percents and gives an idea where the observed value is situated between the extreme values (minimum and maximum) in the previous years. Lower and higher values indicate bad and good vegetation state conditions, respectively.

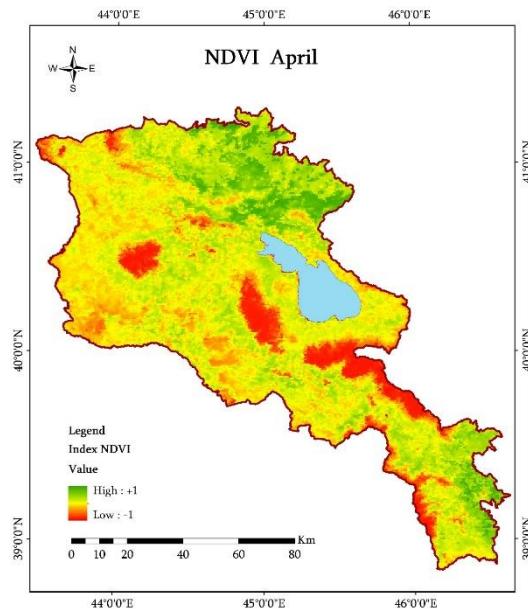
As can be seen from the April VCI map of Armenia, published on the FAO website, favorable conditions for the growth and development of vegetation were observed in almost the entire area, except for the high-mountain areas, where the vegetation had not yet started.



3.2 Normalized Difference Vegetation Index (NDVI)

The Normalized Difference Vegetation Index (NDVI) is an indicator of photosynthetically active biomass which is obtained by comparing the amount of absorbed visible red light and reflected infrared light. NDVI defines values from -1.0 to 1.0 where negative values coincide with areas devoid of vegetation.

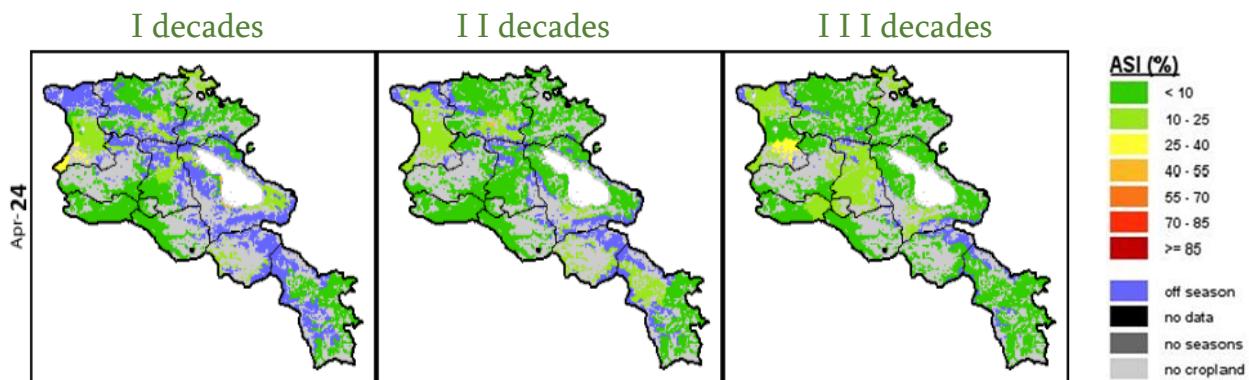
Positive NDVI values prevail in most of the territory of Armenia; therefore, favorable conditions for vegetation were observed.



3.3 Agricultural Stress Index (ASI)

The Agricultural Stress Index (ASI) indicates the impact of agricultural drought. ASI integrates the temporal and spatial image of the Vegetation Health Index (VHI). ASI estimates the intensity and duration of dry spells during the growing season of agricultural crops. Areas with VHI values below 35 percent are critical to assessing the intensity of drought.

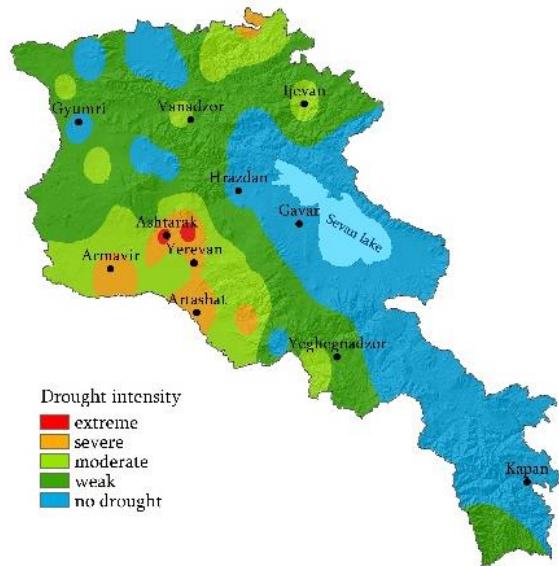
There has been no agricultural drought in the republic, as shown by VCI maps in April.



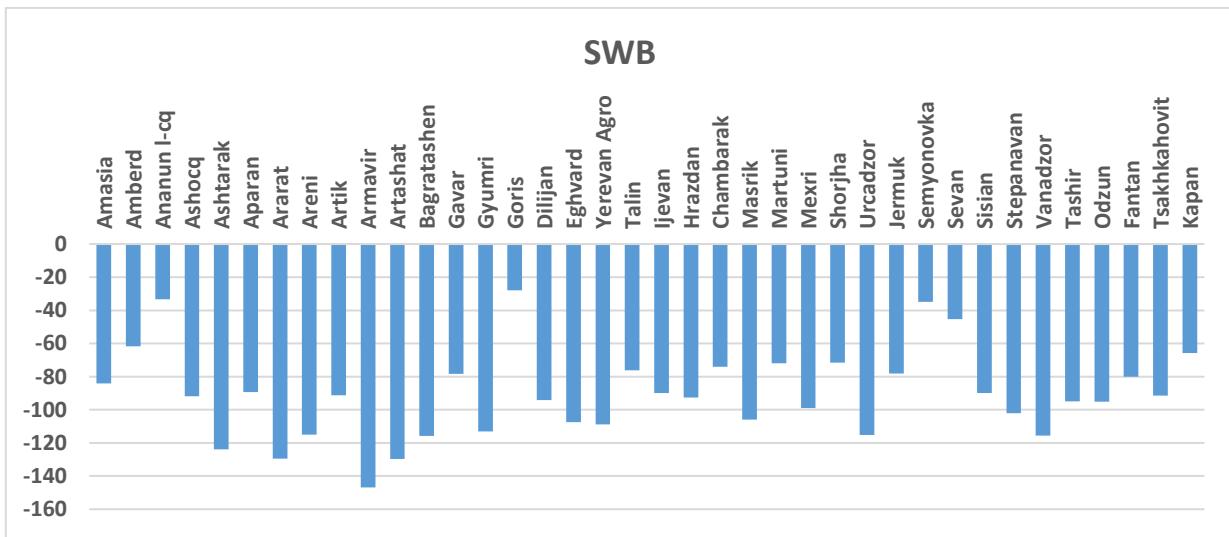
3.4 Assessment of meteorological drought intensity

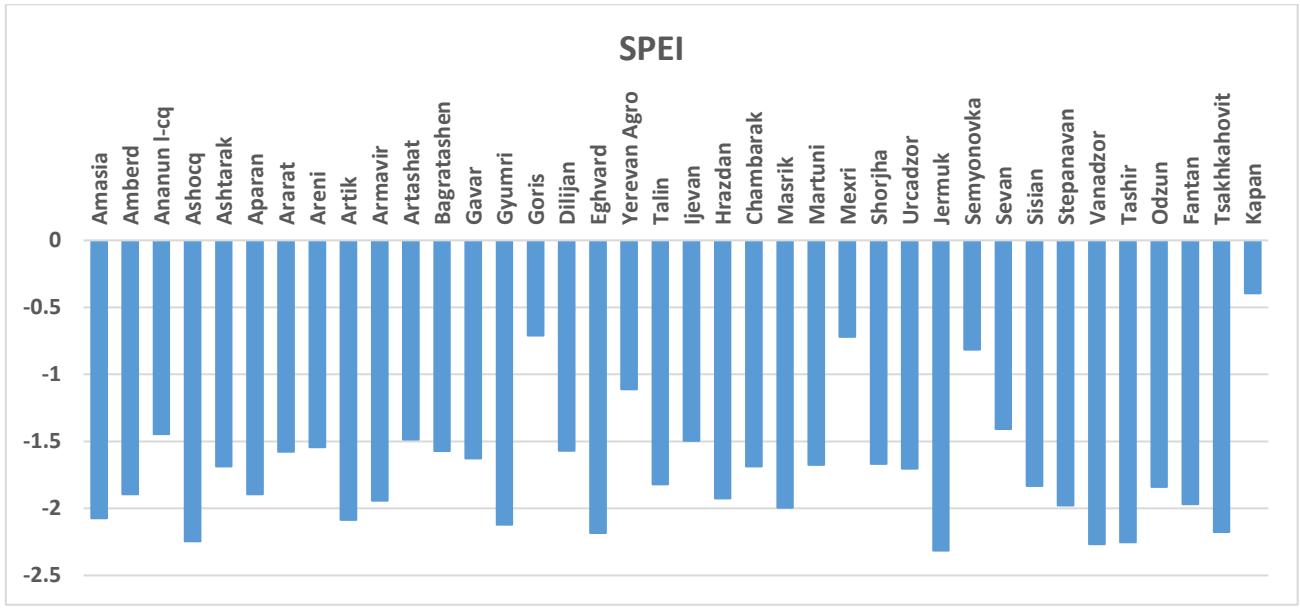
Drought intensity was evaluated by Selyaninov's hydrothermal coefficient according to the data of 38 meteorological stations. The map of the third decade of April show that droughts have not been observed in most of regions Armenia, except a small part of the Ararat Valley.

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Drought Monitoring, 21-30 April, 2024



Drought intensity was evaluated based on the Standardized Precipitation Index (SPI) as well . SPI is a statistical indicator, which calculates and compares the amount of observed precipitation in a given month to long-term climatological precipitation distribution for the same period. SPI was calculated for monthly (SPI1) and quarterly (SPI3) periods.In addition the SWB (Soil Water Balance) was calculated which is an index based on the difference between monthly precipitation and potential evapotranspiration. Lastly, the SPEI drought index was calculated. SWB was used as input to calculate SPEI. Calculations were performed with the R Studio software package.

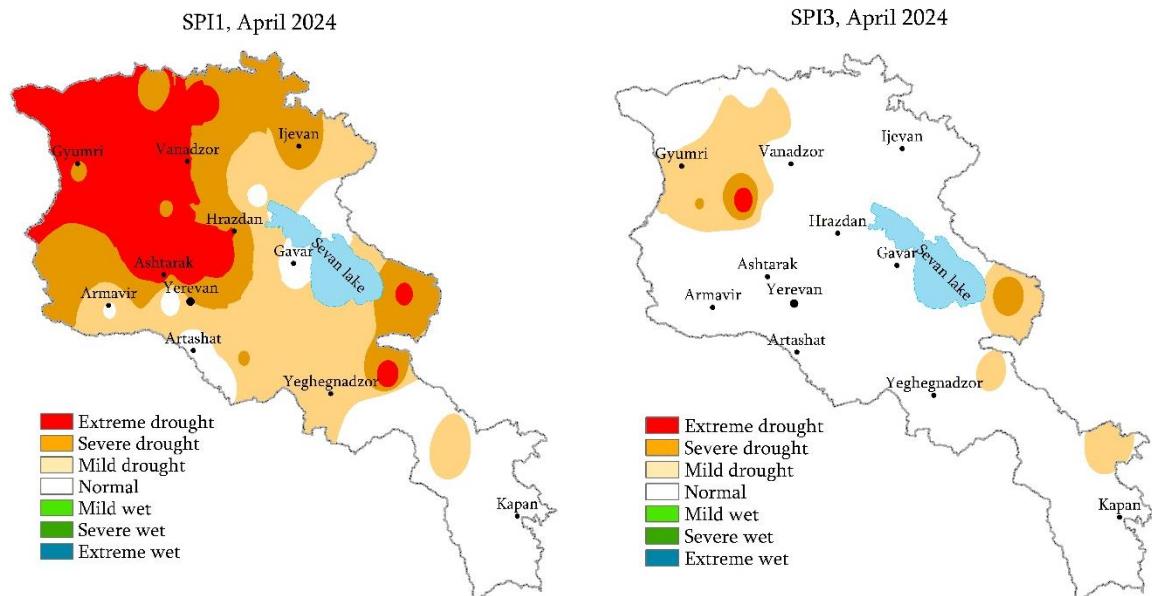




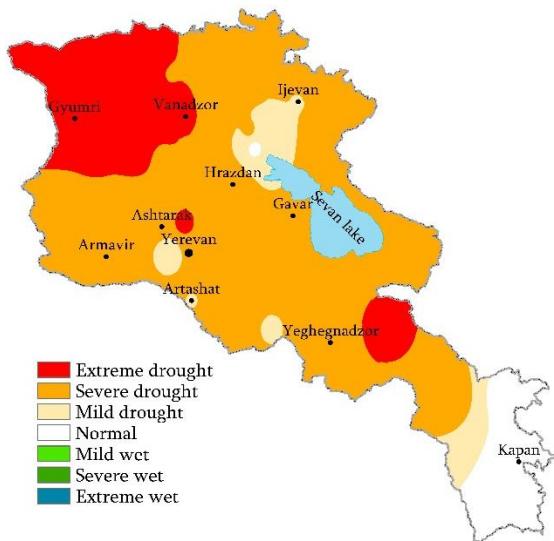
A map of SPI1 in April shows that strong drought conditions have been observed in central, northern, and western Armenia due to low monthly precipitation.

SPI3 reflects strong and moderate local droughts in the region of Shirak and at Masrik Station.

The SPEI map shows that drought conditions were not observed in Syunik region, while dry conditions were observed in the central, northern, and western regions due to high temperatures and low rainfall.



SPEI, April 2024



Thus, analyzing the actual temperature and rainfall deviations, as well as the value of vegetation indexes, we can conclude that despite the low precipitation, the air temperature was not quite high in April to form drought conditions. Nevertheless local droughts have been observed in some low elevated areas.