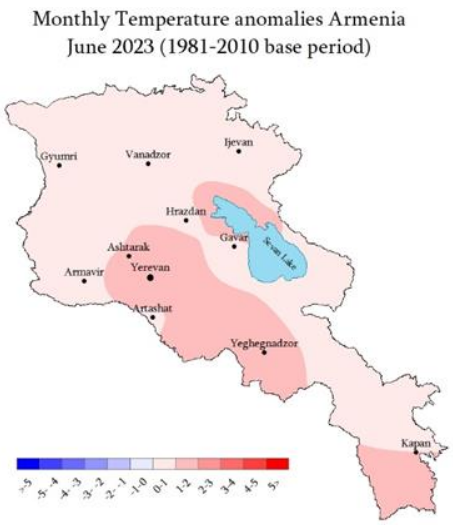
DROUGHT MONITORING BULLETIN

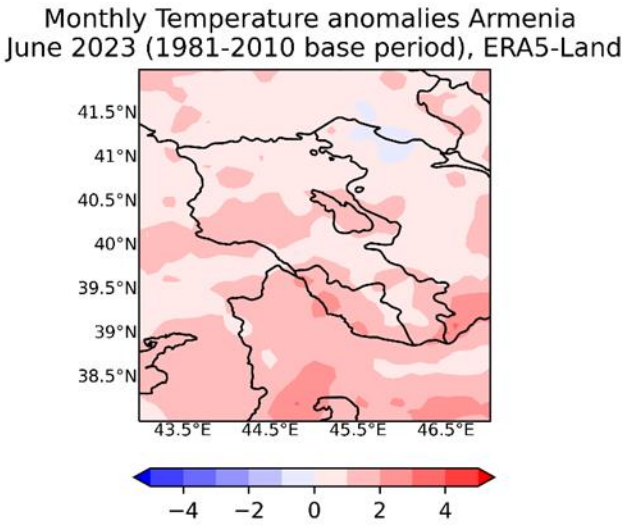
2023 June

Content

1. Monthly temperature anomaly

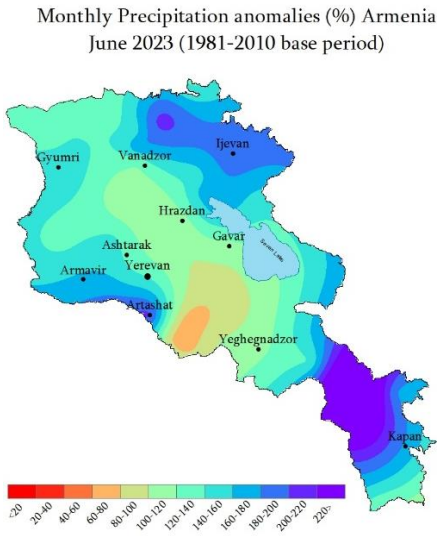
In June , the average monthly air temperatures exceeded the norm (1981-2010). According to the observations of 43 meteorological stations of Armenia the average monthly air temperatures were higher than normal or close to normal (up to 1-2℃ deviation). At the same time, deviations of average monthly temperatures of the ERA5-Land global reanalysis successfully captured the observed positive anomalies of temperatures in the territory of Armenia in June.

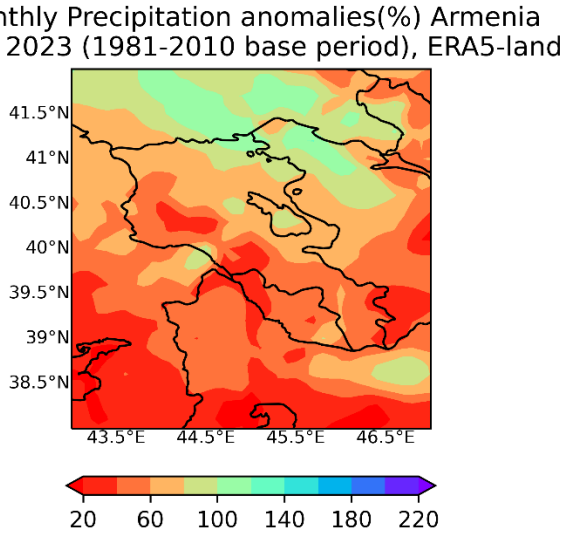




2. Monthly precipitation anomaly

June was mainly accompanied by higher than normal precipitation, except for the central regions of the republic, where the precipitation was close to the norm, with a negative deviations (at some places up to 65-70%). In Syunik, Tavush and Ararat valley monthly precipitation exceeded the norm twice. 160 mm of precipitation was observed in Sisian (300% of the norm). In contrast to the observations, ERA5-Land global reanalysis precipitation data show that in June, precipitation was lower than normal in most regions of Armenia., and monthly precipitation consisted of 40-60 % of the norm in most regions of Armenia.

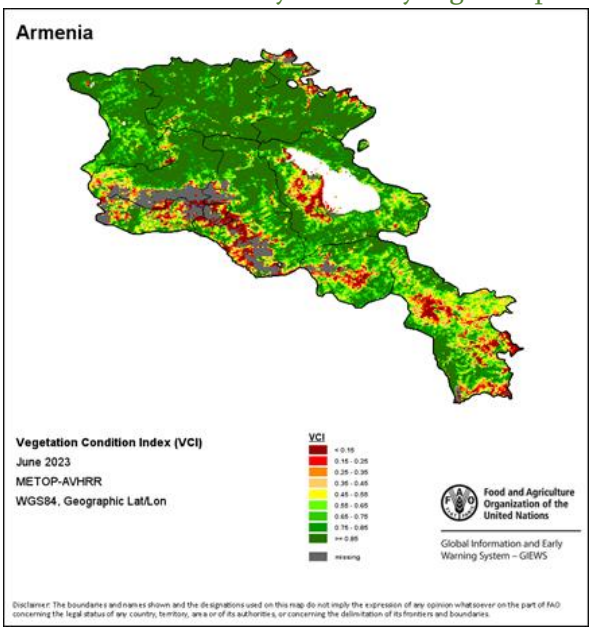




3. Drought indices

3.1 Vegetation Condition Index (VCI)

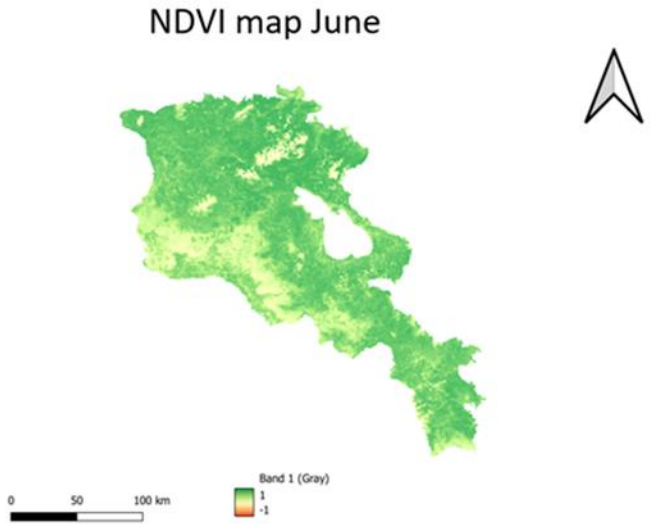
VCI shows the condition of vegetation in a given period compared to the average condition of vegetation associated with the climatic conditions of the given location. Lower and higher VCI values indicate poor and good vegetation conditions, respectively. As can be seen from the June VCI map published on the FAO website, there was no drought conditions in the territory of Armenia except for some parts of the Ararat valley caused by high temperatures.



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. As can be seen from the June NDVI map based on eVIIRS satellite, there was no drought conditions in the territory of Armenia except for some parts of the Ararat valley caused by high temperatures.

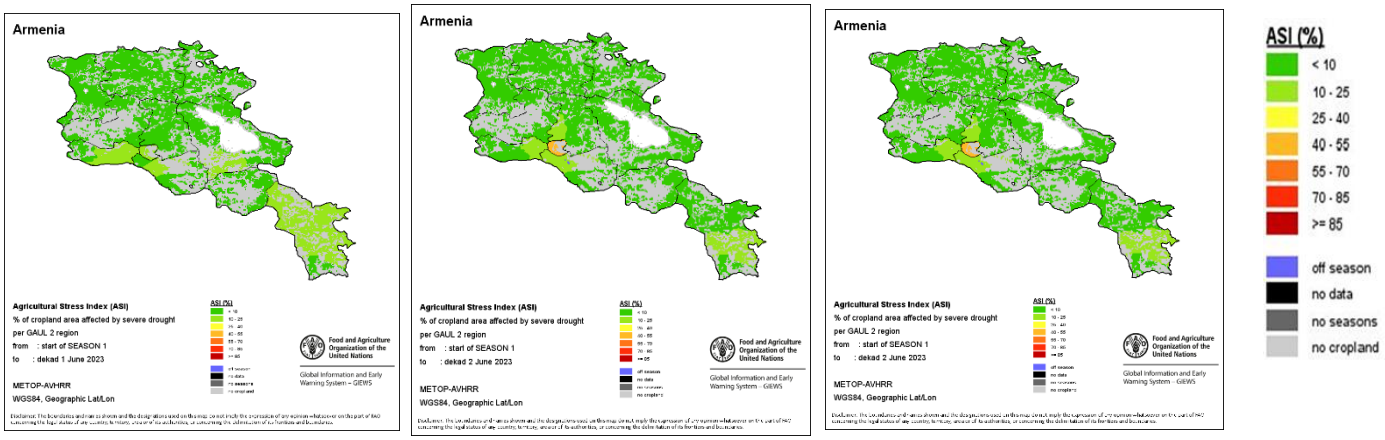


3.3 Agricultural Stress Index (ASI)

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.

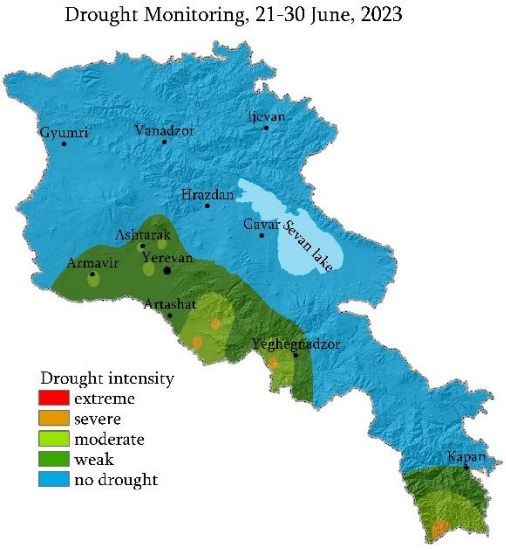
As can be seen from the data of June, there was no agricultural drought in the territory of the republic except for some parts of the Ararat valley .

1st decade 2nd decade 3rd decade

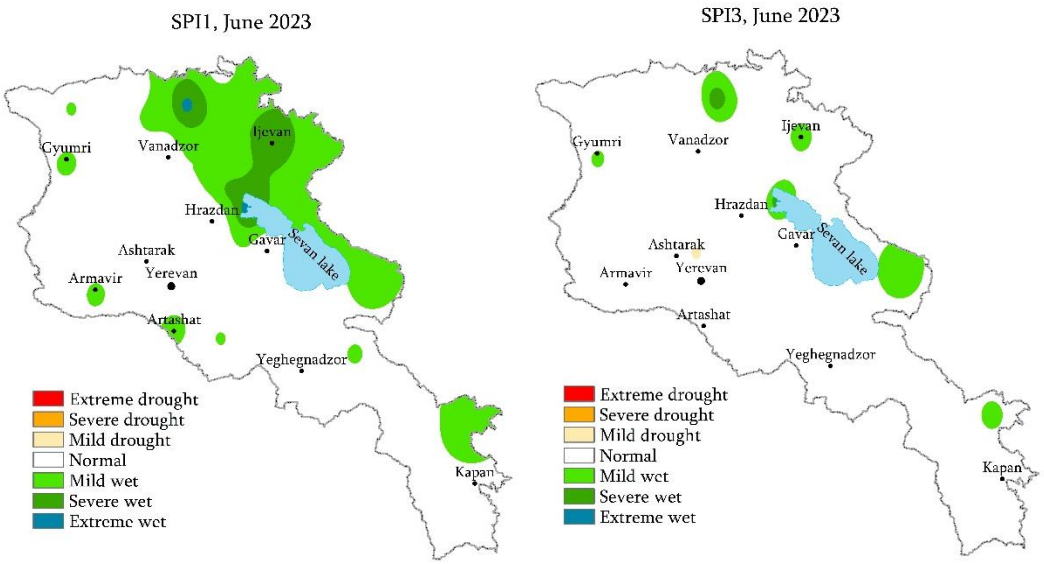


3.4 Assessment of meteorological drought intensity

Drought intensity was evaluated by Selyaninov's hydrothermal coefficient according to the data of 38 meteorological stations. The drought intensity map shows that there were no drought conditions in the territory of Armenia, except for some stations in the Ararat valley and in the Syunik region, where strong drought conditions were observed.



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 at the same location. SPI is calculated monthly (SPI1) and quarterly (SPI3) periods. Calculations were performed with the R Studio software package. As can be seen from the map of June, there were no drought conditions in June. In the north-eastern part of Armenia, the values of SPI1 reflect quite wet conditions, which corresponds to the map of the observed precipitation.



Thus, analyzing the observed temperature and precipitation anomalies, as well as the values of the drought and vegetation indices, we can conclude that the observed weather conditions observed in June have not led to the formation of drought conditions in Armenia, except for some valley regions in Syunik and Tavush, and in some parts of the Ararat valley.