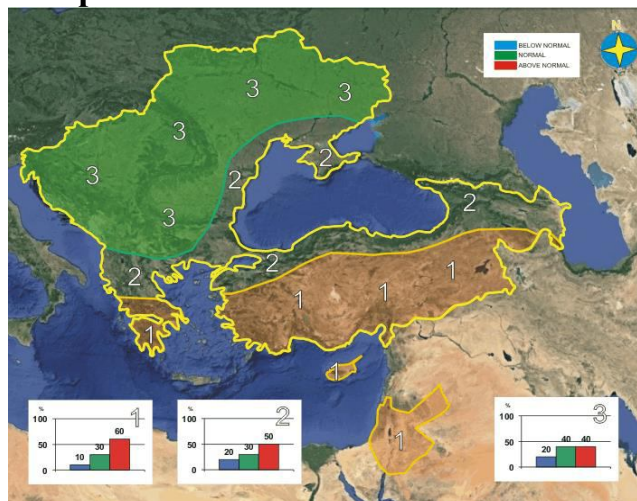


# VERIFICATION OF THE SEECOF-15 SUMMER 2016 CLIMATE OUTLOOK FOR THE TERRITORY OF UKRAINE COMPARED TO THE 1981-2010 BASE PERIOD

## Temperature

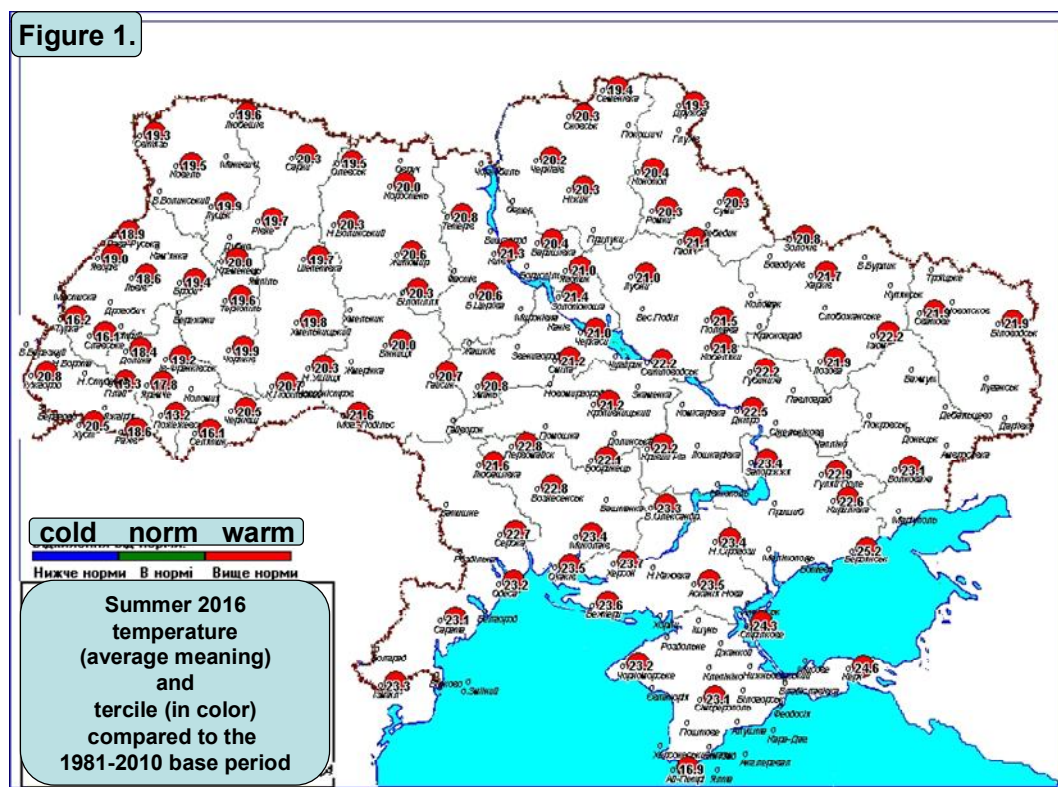


According to the SEECOF-15 outlook for the summer 2016 in Ukraine, seasonal temperature in Ukraine was expected warmer (upper tercile) and normal with 40% probability and below (low tercile) with 20% probability, compared to the 1981–2010 climatological base period.

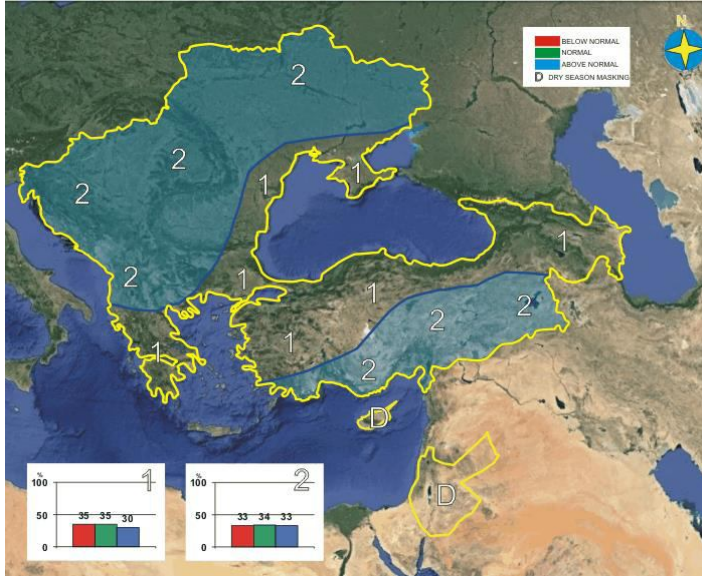
Climatological monitoring showed that the the summer 2016 was warm in Ukraine with above normal temperature based on the tercile method (Figure 1).

Verification showed that the temperature reached upper tercile which was indicated in the outlook with the 40% probability. The outlook for a warm summer (whith probability 50% or 60%) could be more correct.

Figure 1.

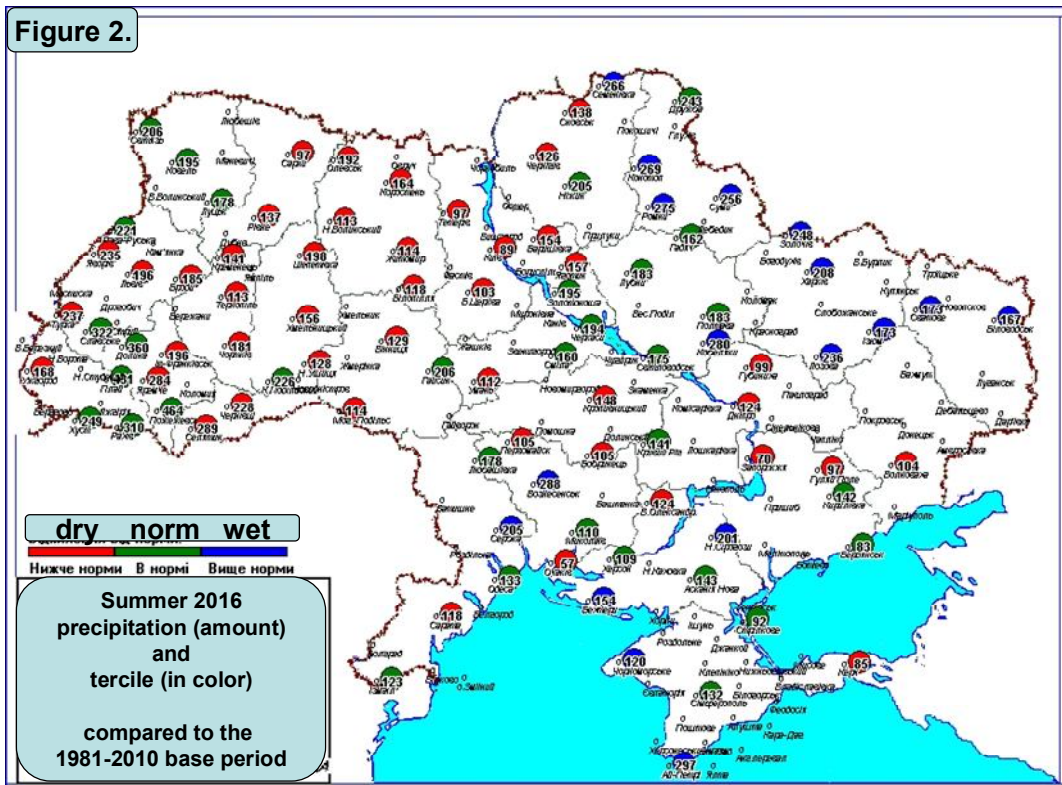


# Precipitation



The SEECOF-15 climate outlook indicated equal probabilities for below (33%), near (34%) and above (33%) normal conditions in most part of Ukraine and for below (35%), near (35%) and above (30%) normal conditions in the far south of country.

Monitoring of precipitation showed extremely unequal distribution dry, normal and wet summer conditions across the country, in the west and north parts (Rivne, Ternopol, Khmel'nitsk, Zytomyr, Vinnytsya, Kyiv regions) were dry conditions and on the north-east (Symmy, Kharkiv, Lugansk regions) were wet conditions based on the tercile method with 1981–2010 climatological base period (Figure 2).





# Analysis of the 2016 summer season for Ukraine compared to the 1961-1990 base period

## Temperature

The average seasonal temperature ranged from 18-19°C in the west and north of the country to 23-25°C in the south, in the Carpathians mountains 16..19°C, highlands – 13..16°C.

Deviations of the mean air temperature were 2..3°C, in the Carpathians mountains locally 1,5..2°C above the climate norm (1961-1990) (Figure 1).



According to the tercile method (with 1961–1990 climatological norm), mean air temperature during summer was in the warm category.

Maximum temperature was in the range from 30,2°C in Lviv region (west) to 40,0°C in Kharkiv region (east), in Carpathian mountains (highlands) 23,2...24,6°C (Figure 2).



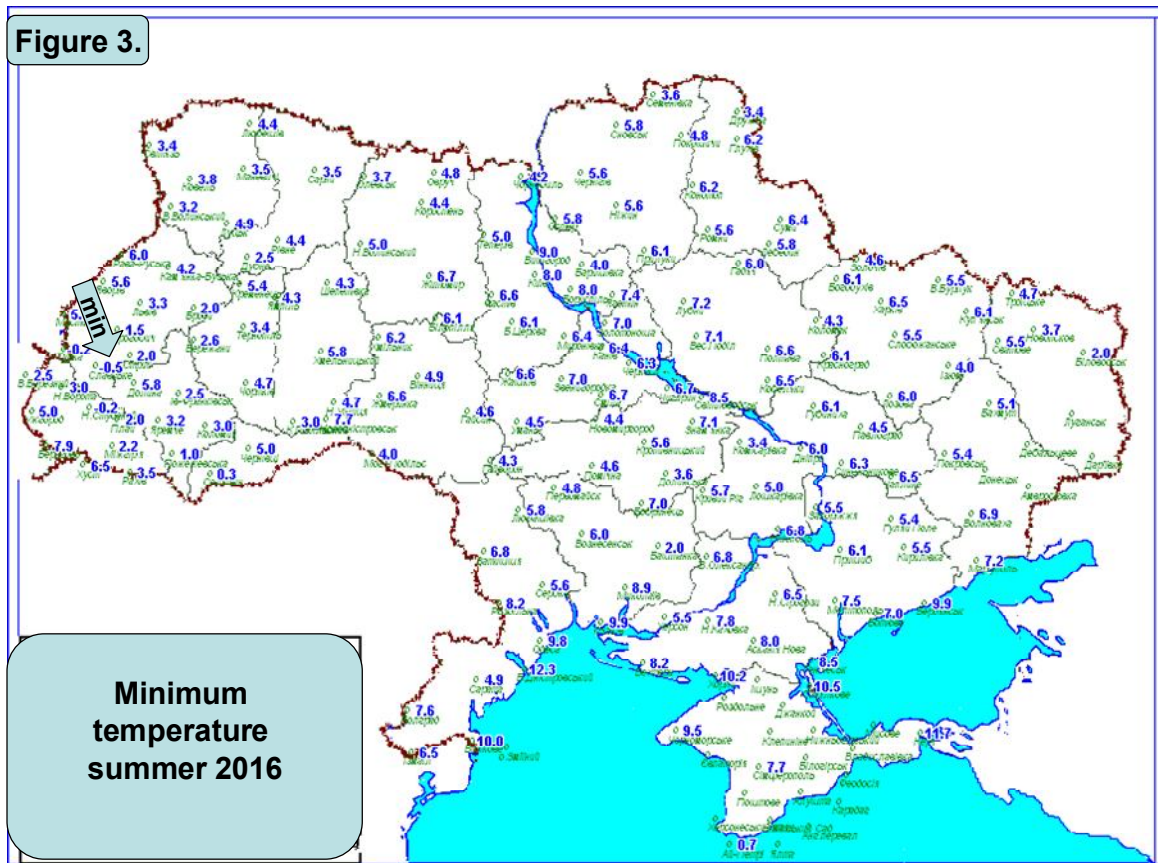
The highest daily air temperature during summer 2016, measuring 40,0°C was observed on 17<sup>th</sup> of July in Kup'yansk of Kharkiv region.

Temperatura 35°C and above is a very dangerous phenomenon for the northwestern part of Ukraine and temperature 40°C and above is very dangerous phenomenon for the southeastern part of Ukraine.

For summer 2016 very dangerous phenomenon 35...37,0°C was recorded by most stations northern and central part and 40°C was observed only one station in southeastern part.

During the summer 2016 July was hottest. On 16-17<sup>th</sup> of July in the east (Sumy, Kharkiv, Donetsk, Zaporizhzhia regions) and center (Poltava, Kropyvnytskiy, Dnipro regions) of the country were recorded the highest July temperature for all history observations.

The minimum temperature ranged from  $-0.5^{\circ}\text{C}$  in Lviv region (west) to  $10.0\text{..}10.5^{\circ}\text{C}$  in Odessa and Kherson region (south), in Carpathian mountains (highlands)  $-0.2\text{..}1.0^{\circ}\text{C}$  (Figure 3).



The lowest air temperature during summer 2016, measuring  $-0.5^{\circ}\text{C}$  was observed on 8<sup>th</sup> of June in Slavske of Lviv region (Carpathian mountains).



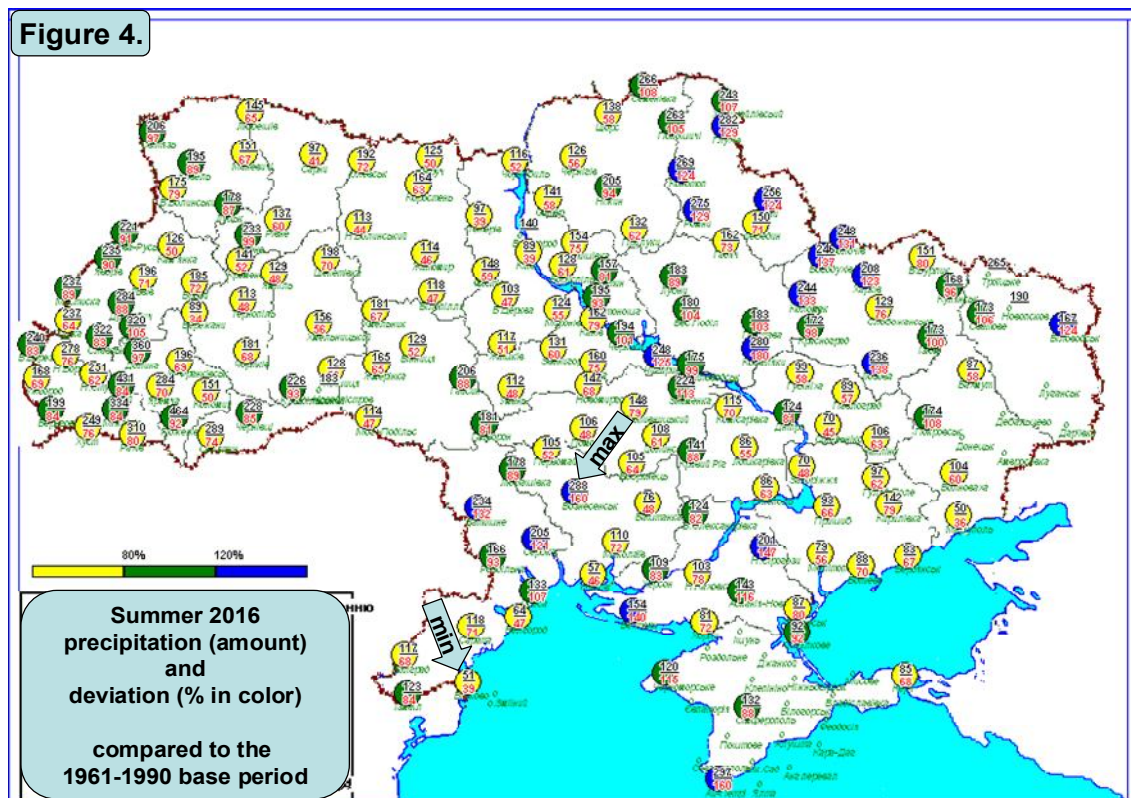
## Precipitation

Unequal distribution dry, normal and wet summer conditions across the country, but most stations recorded insufficient wetting (34-80%) compared to the 1961-1990 climate norm. Seasonal precipitation was ranged from 51 mm (south of Odessa region) to 288 mm (north of Mykolayiv region), in the Carpathian region from 237mm to 464 mm (62-105%)(Figure 4).

Most of the summer rainfall were associated with convective processes in the fronts and inside of warm and wet masses, powerful cyclones were absent in Ukraine last summer.

The biggest daily presipitation was recorded in Konotop of Sumy region (northeast of country) – 99 mm on 17<sup>th</sup> of June.

In the west and norht parts (Rivne, Ternopol, Khmelnitsk, Zytomyr, Vinnytsa, Kyiv regions) were atypical dry summer conditions 34...75% of climate norm. For Ternopol last summer was driest since 1961.



According to the tercile method (with 1961–1990 climatological norm), precipitation during summer slightly more than half of stations (55%) were in the dry category, in normal 30% and wet category 15% of stations.

# Analysis of the summer 2016 season for Ukraine compared to the 1981-2010 base period

## Temperature

The mean air temperature during summer 2016 was 18..21°C in the west and north parts of the country, 21..23°C in the central and east, 23..25 in the south. Deviations the mean air temperature during summer 2016 from average values of the 1981-2010 base period were 1..2,4°C, in local places of the west deviations were less then 1°C (Figure.1).

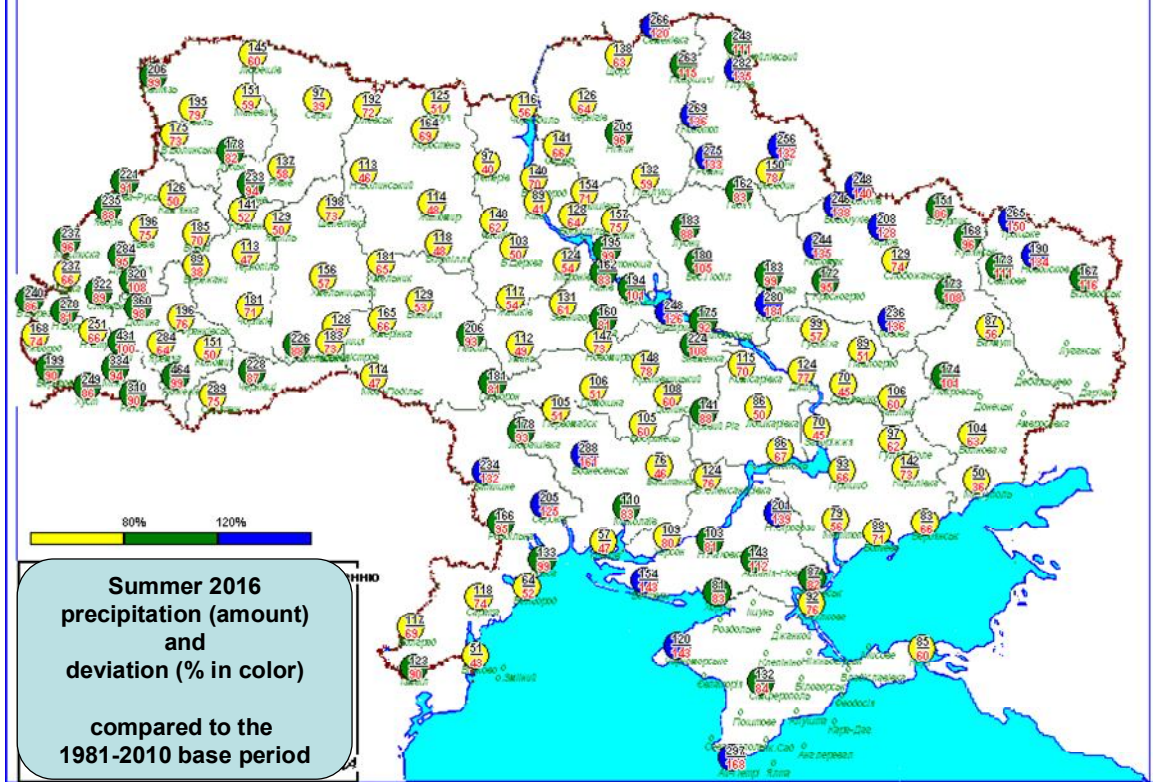


From month to month temperature deviation was homogeneous, only in August in the west of country were deviations within the limits -1 .. 1°C and in the southeastern part – +2,9.. 3.3°C compared to the average values of the 1981-2010 base period.

## Precipitation

Generally in summer 2016 was dominated dry conditions (38..78%), in the northeastern part and in some places in the center and the south - normal and excess moisture 80..161%, in the west were places with normal precipitation 80..108% compared to the average values of the 1981-2010 base period (Figure.2).

Figure 2.



From month to month summer precipitation was not homogeneous.

**In June** were most favorable conditions for moistening, most stations recorded normal and excessive amount of rainfall 85...254% of the average monthly amount (1981-2010 base period).

**In July** dry conditions dominated, fell the least of rain in the summer 20..70%, in the some places of the central and southern parts 2..16% of the average monthly amount (1981-2010 base period).

**In August** the moistening improved in the northeast, in some places in the center and south, fell 100..345% of the average monthly amount (1981-2010 base period).