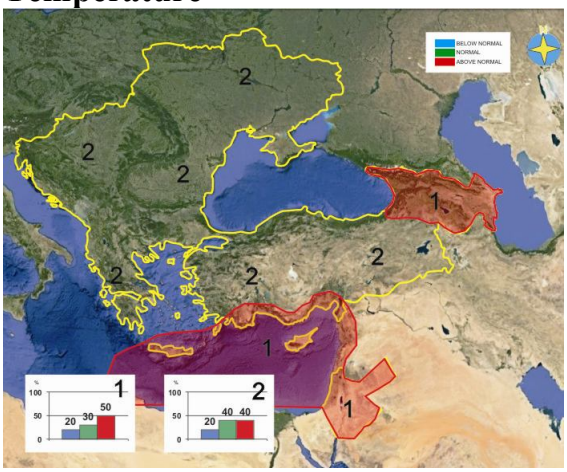
VERIFICATION OF THE SEECOF–13 SUMMER 2015 CLIMATE OUTLOOK FOR THE TERRITORY OF UKRAINE COMPARED TO THE 1981–2010 BASE PERIOD

Temperature



According to the Consensus statement of SEECOF-13, mean summer seasonal temperature in Ukraine was expected to be: warmer than average (temperature in the upper tercile) with 40% probability, average with 40% probability and below average with 20% probability, compared to the 1981–2010 climatological base period.

Based on the meteorological monitoring, the deviation of the mean air temperature from the average 1981-2010 base period during summer 2015 ranged from 0,4ºC in Kremia region to 2,5ºC in Khmelnits'ki region and in the high-lying areas from 1,3°C to 2,8°C in Ukrainian Carpathians and Crimean mountains (*Figure 1, lower figure and colored circle*). Most stations the deviation of the mean air temperature is +1..3°C. Negative deviations were not recorded on the territory of Ukraine.

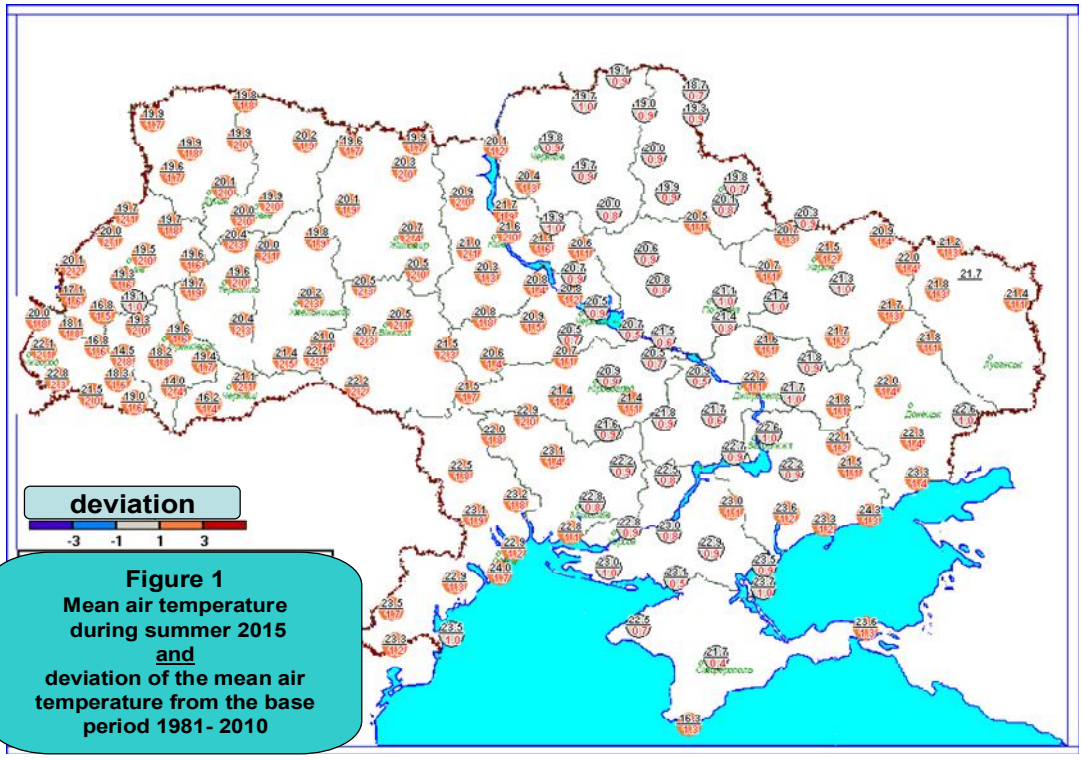
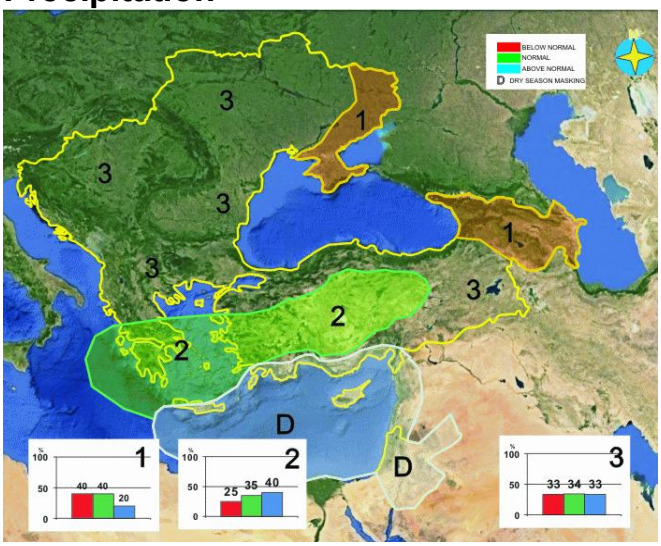


Figure 1
Mean air temperature during summer 2015 and deviation of the mean air temperature from the base period 1981- 2010

Precipitation



The SEECOF–13 climate outlook indicated the probabilities for below, near or above average conditions were expected to be approximately equal to the moust territory of Ukraine, only in the east, southeast and in Crimea regions greater probability for below and near average conditions (40%) and less (30 %) for the wet season.

Monitoring of precipitation showed dry summer conditions across most of Ukraine (*Figure* 2). Precipitation were in the range from 31 mm to 375 mm. The least amount of rainfall recorded in Crimea (Chornomors'ke), Kyiv region (Teteriv) and largest – in Odesa region (Bilgorod-Dnistrovski). In most of the Ukraine summer precipitation were in the range 13..80% relative to the average values of the base period 1981-2010, only in the central, southern and eastern part of Ukraine were places with normal (80..120%) and excess (120..302%) moisture.

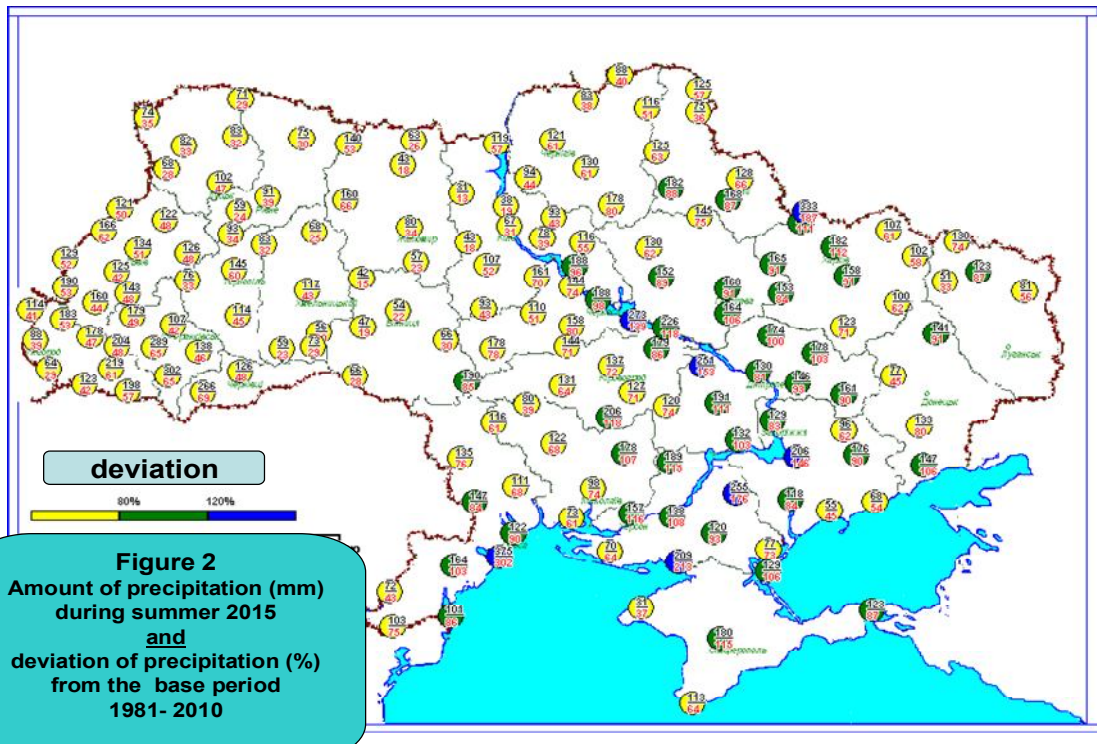


Figure 2
Amount of precipitation (mm) during summer 2015
and
deviation of precipitation (%) from the base period 1981- 2010

Analysis of the 2015 summer season for Ukraine compared to 1981-2010 base period

Temperature

During summer 2015, mean air temperature ranged between 18,7°C in the Symu region and 24.0°C in the Odesa region and in the mountain areas from 14,0°C to 18,3C in Ukrainian Carpathians and Crimean mountains (*Figure 1, upper figure)*

The deviation of the mean air temperature from the 1981- 2010 base period during summer 2015 ranged from 0,4ºC in Kremia region to 2,5ºC in Khmelnits'ki region and in the high-lying areas from 1,3°C to 2,8°C in Ukrainian Carpathians and Crimean mountains (*Figure 1, lower figure and colored circle*).

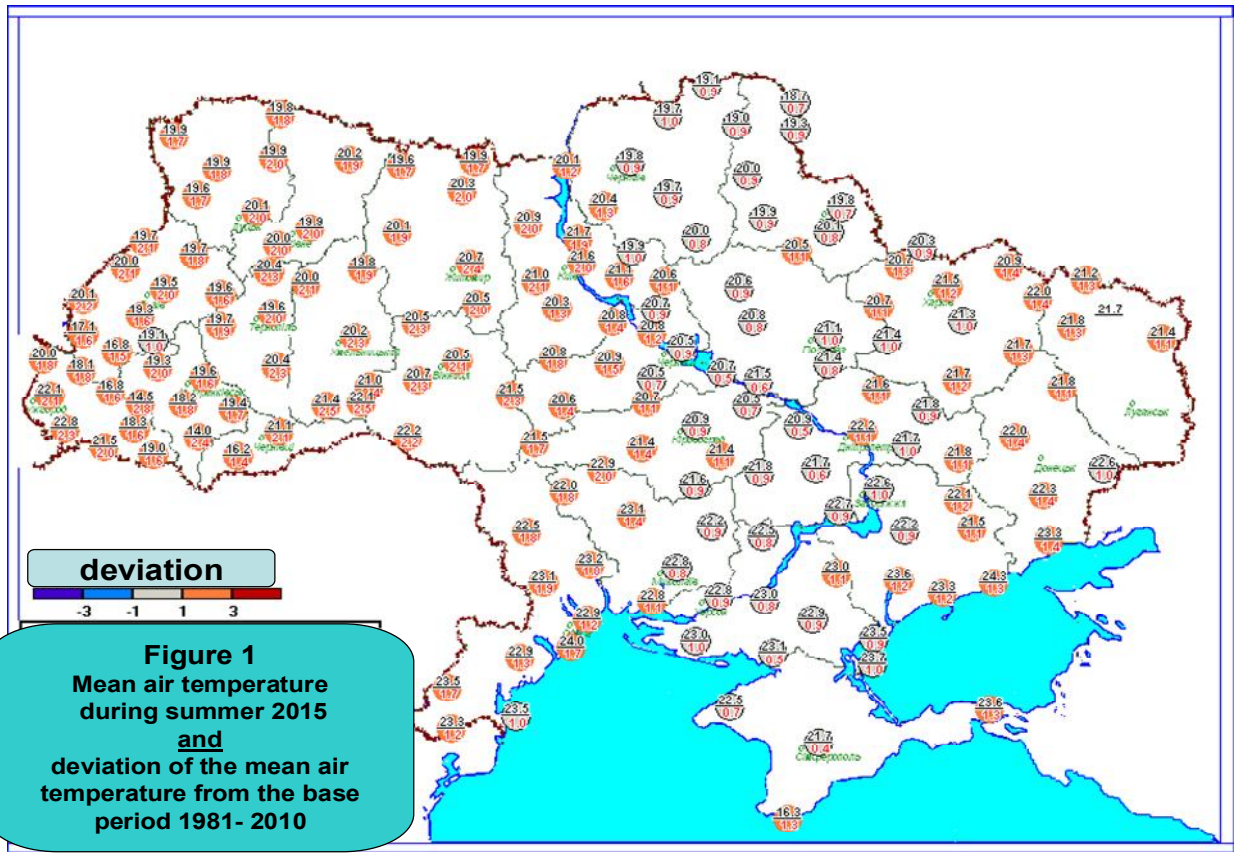


Figure 1
Mean air temperature during summer 2015
and
deviation of the mean air temperature from the base period 1981- 2010

The highest daily air temperature during summer 2015, measuring 40,0°C was observed on 24 July in Haivoron of Kirovograd region(*Figure 2*).

Temperaratura 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 2015 very dangerous phenomenon 35…37,9°C was recorded by most stations northwestern part and 40°C was observed only one station southeastern part.

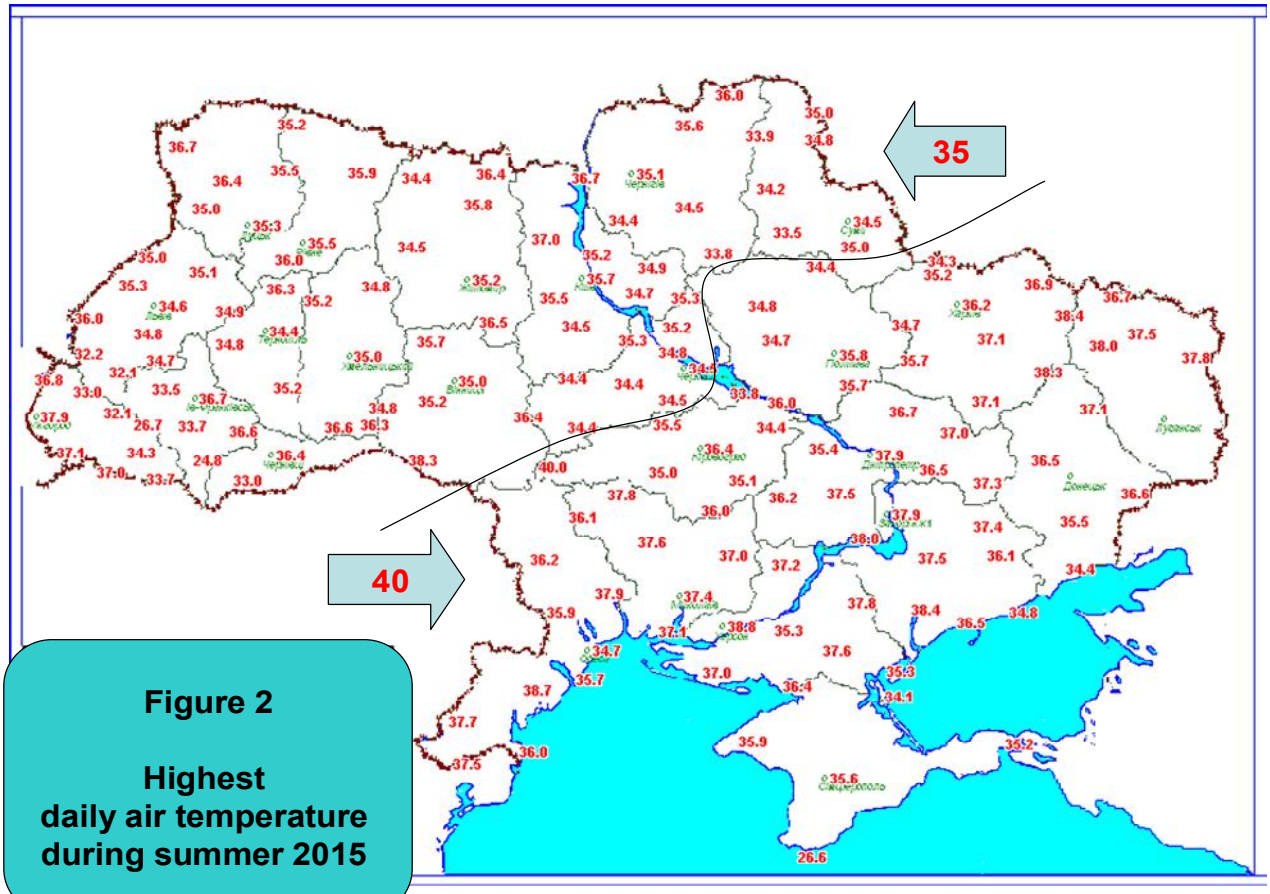


Figure 2

Highest daily air temperature during summer 2015

The number of summer days with the maximum daily air temperature above 30°C varied from 20 to 35 days in the most of regions, whith maximum from 40 to 45 days in the Zakarpat'a, Dnepropetrovsk, Mukolaiv, Kherson regions (*Figure 3 upper figure*).

In the high mountain areas (above 1000m) didn't observe any summer days with temperature above 30°C.

The greatest uninterrupted period of tropical days was registered in Krimea region, total of 23 days (*Figure 3, lower figure*).

There are a lot of days (20..43) with temperatures above 30°C was recorded in the western and northern parts that are not typical for the climate of these regions.

During the summer 2015 August was hottest. From 4 to 13 August was fixed at most stations the marathon uninterrupted temperature 30°C and above.

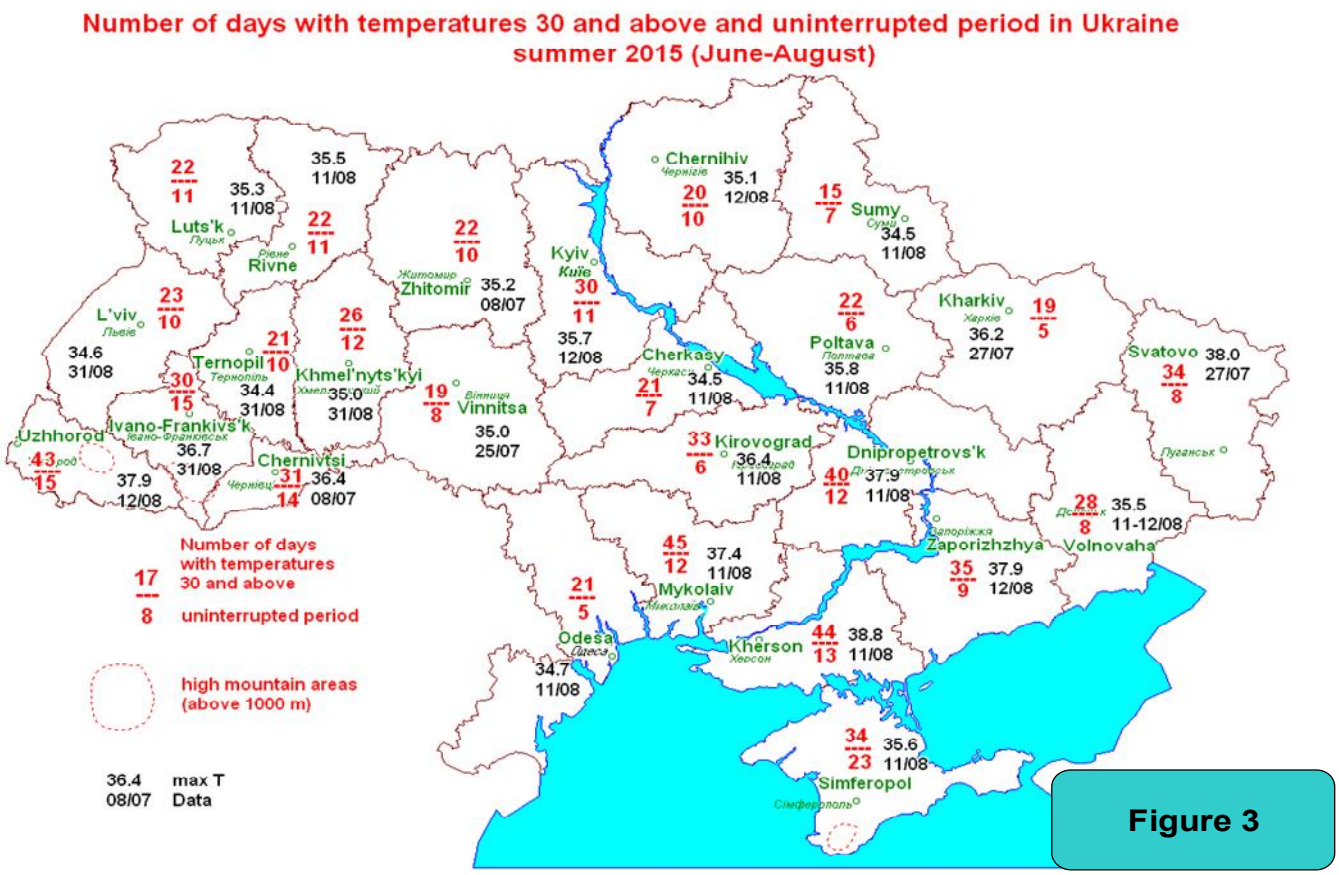


Figure 3

Three-month course of the maximum, minimum air temperature in Kyiv (north), Kherson (south), L'viv (west), Kirovograd (center), Kharkiv (east) during summer 2015 is shown in Figures 4, 5, 6, 7 and 8.

The maximum temperature does not exceed the absolute maximum values recorded in the history of observations. It repeated the absolute values in July and August in Kyiv, L'viv, Kirovograd and in July in Kharkov.

Maximum and minimum temperature of summer 2015

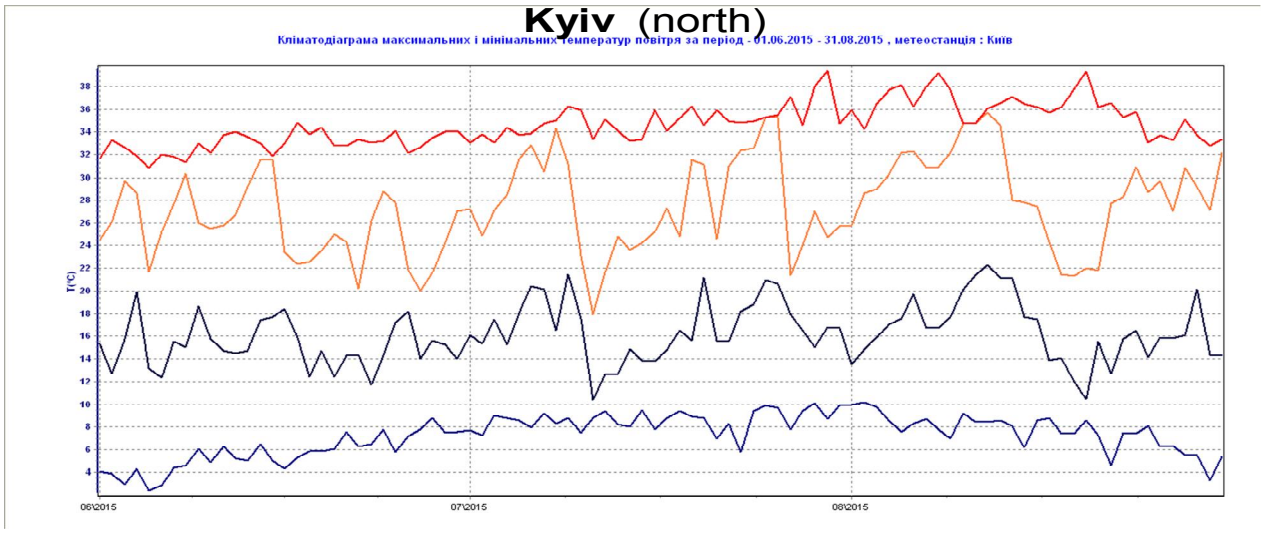
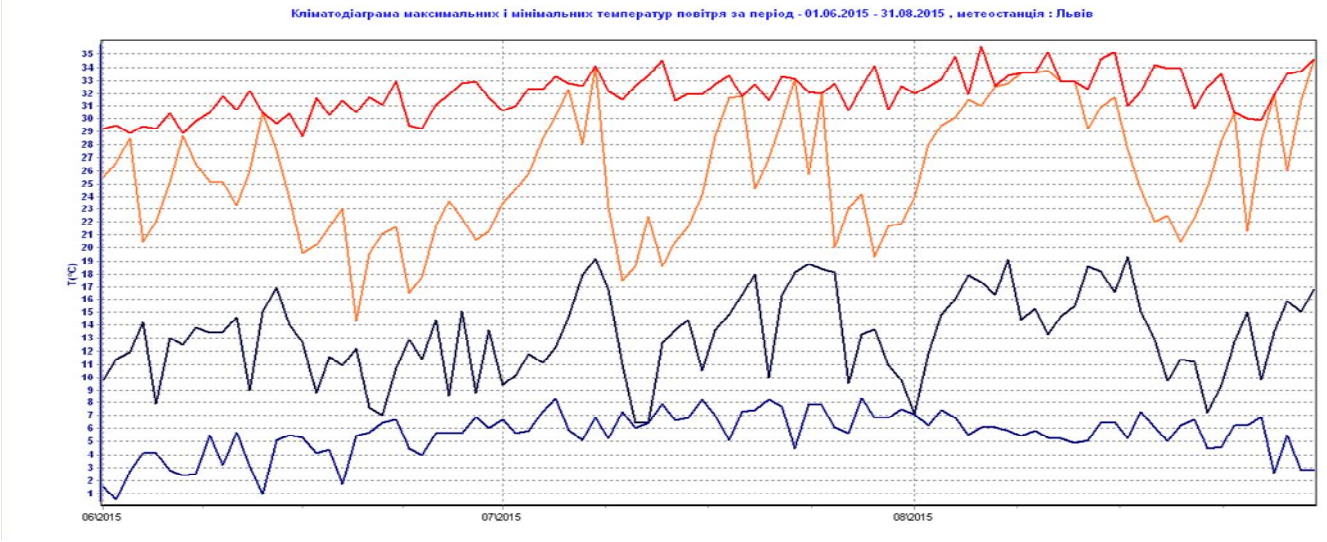


Figure 4

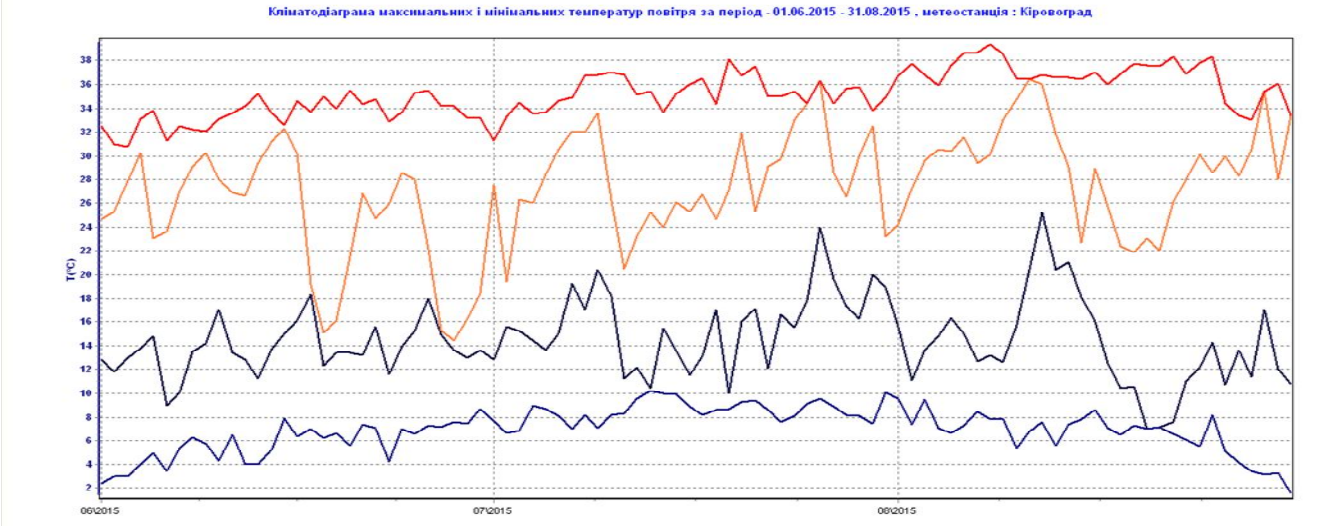
Maximum and minimum temperature of summer 2015
L'viv (west)



Temperature - absolute maximum
maximum temperature of summer 2015
Temperature - absolute minimum
minimum temperature of summer 2015

Figure 5

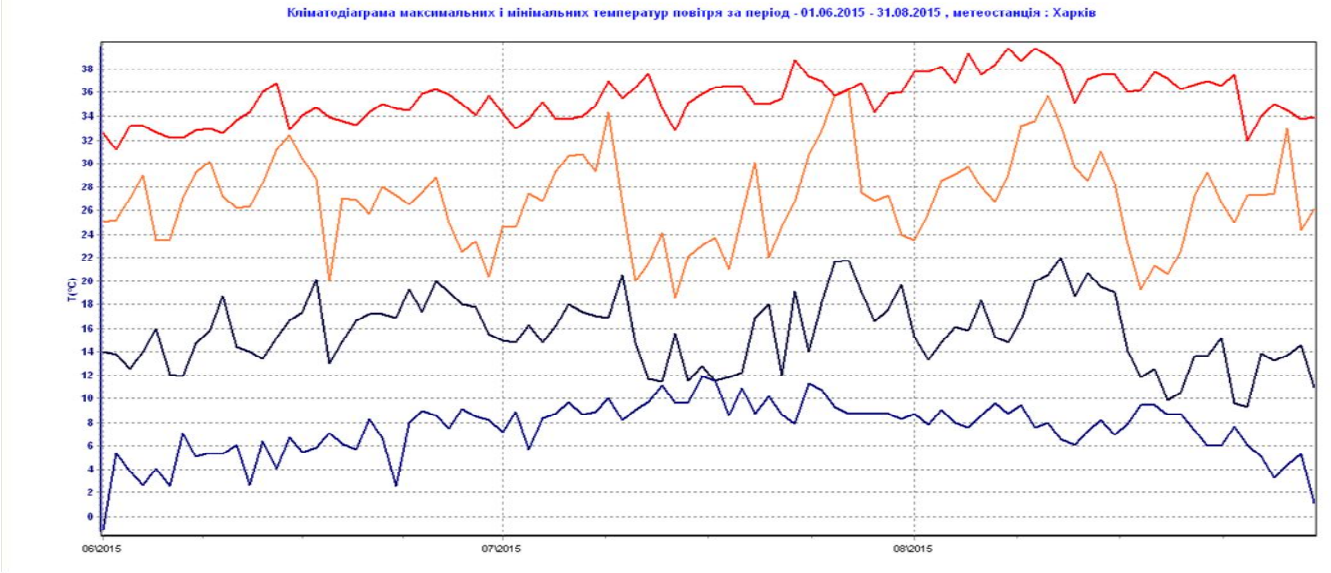
Maximum and minimum temperature of summer 2015
Kirovograd (center)



Temperature - absolute maximum
maximum temperature of summer 2015
Temperature - absolute minimum
minimum temperature of summer 2015

Figure 6

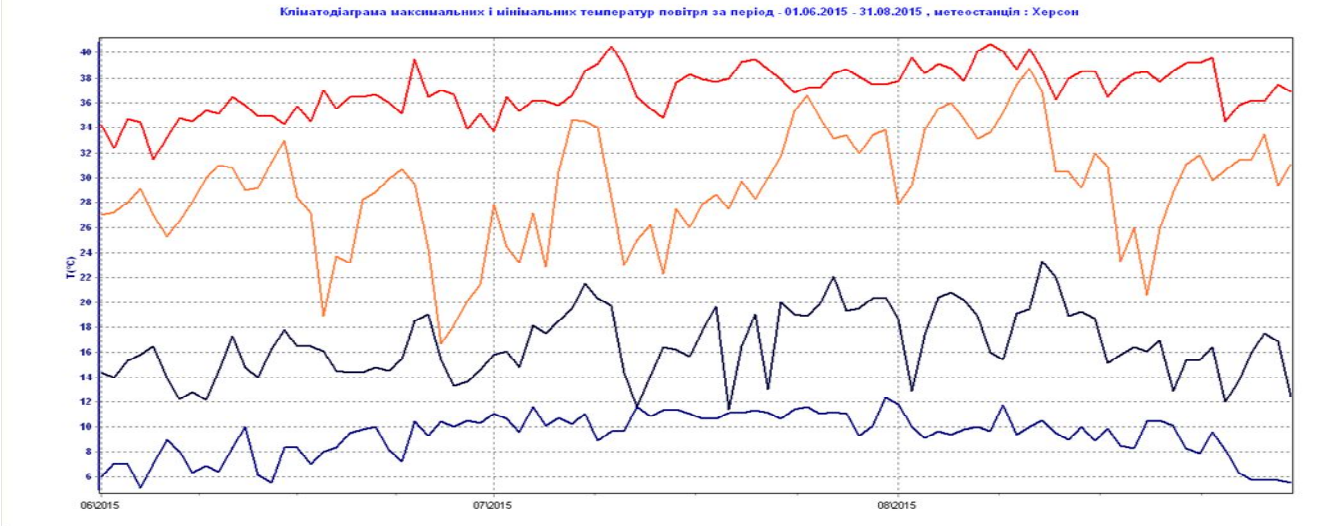
Maximum and minimum temperature of summer 2015
Kharkiv (east)



Temperature - absolute maximum
Temperature - absolute minimum
maximum temperature of summer 2015
minimum temperature of summer 2015

Figure 7

Maximum and minimum temperature of summer 2015
Kherson (south)



Temperature - absolute maximum
Temperature - absolute minimum
maximum temperature of summer 2015
minimum temperature of summer 2015

Figure 8

Precipitation

During summer 2015, precipitation sums were less then average values to the base period 1981 – 2010 in most of Ukraine with the exception some plases of the easten, central and sourthen parts. Precipitation were in the range from 31 mm to 375 mm. The least amount of rainfall recorded in Crimea (Chornomors'ke), Kyiv region (Teteriv) and largest – in Odesa region (Bilgorod-Dnistrovski). Precipitation sums ranged from 13% in Teteriv to 302% Bilgorod-Dnistrovski compared to the average of the base period (*Figure 9*).

The maximum daily amount of precipitation of 108 mm (storm water) was registered in Haivoron Vinnitsa region (on 9st of July).

Low rainfall has resulted to extremely low water content in rivers on the territory of Ukraine. The low water started in June and lasted all summer.

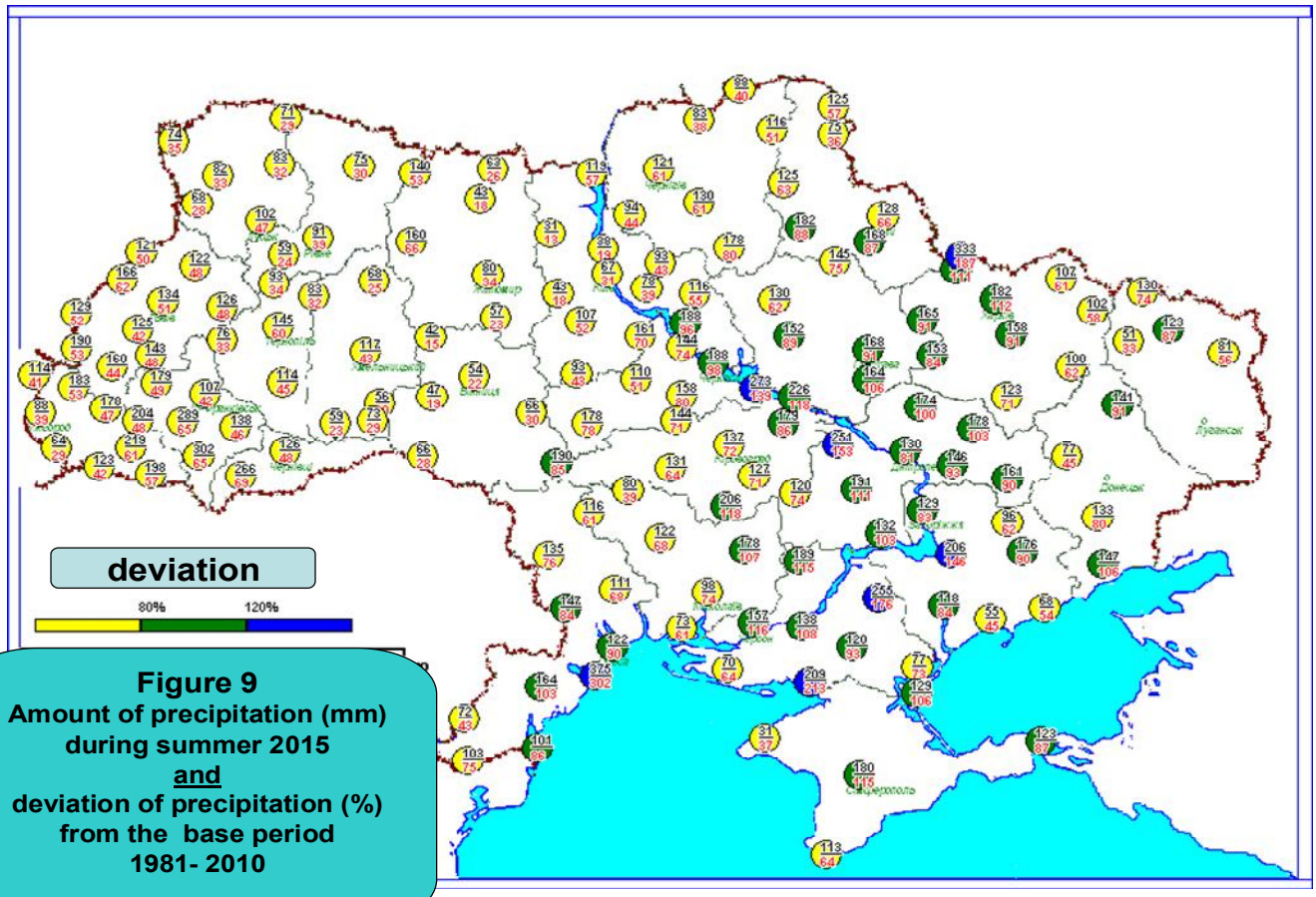


Figure 9
Amount of precipitation (mm) during summer 2015
and
deviation of precipitation (%) from the base period 1981- 2010

National Climate Bulletin and the assessment of the SEECOF -13
Climate state outlook for the previous season
Ukraine

- Climatological reference period is 1981 – 2010

Summer 2015		Air Temperature (°C)					Precipitation sums (mm)			
Station	Rank	**33**	**50**	**66**	Observed	Rank	**33**	**50**	**66**	Observed
Kyiv	**2**	19.2	19,5	19,8	**21,6**	**1**	199	215	231	**67**
Luts'k	**2**	17,7	18,0	18,5	**20,1**	**2**	171	199	236	**102**
Rivne	**2**	17,5	17,8	18,3	**19,9**	**1**	194	236	256	**91**
L'viv	**1**	17,0	17,4	18,0	**19,5**	**2**	221	251	284	**134**
Ternopil'	**2**	17,2	17,6	18,1	**19,6**	**5**	204	242	268	**145**
Khmel'nits'ki	**2**	17,6	17,9	18,2	**20,2**	**1**	241	263	313	**117**
Uzhgorod	**1**	19,5	19,8	20,2	**22,1**	**1**	185	203	264	**88**
Ivano-Frankivs'k	**3**	17,6	18,1	18,3	**19,6**	**1**	215	235	283	**107**
Chernivtsi	**2**	18,6	18,9	19,4	**21,1**	**1**	300	263	275	**126**
Zhutomur	**2**	17,9	18,2	18,9	**20,7**	**1**	196	246	277	**80**
Chernihiv	**11**	18,4	18,8	19,0	**19,8**	**8**	170	197	210	**121**
Symu	**12**	18,4	19,0	19,4	**19,8**	**5**	161	189	213	**128**
Vinnuts'a	**4**	18,0	18,3	16,6	**20,5**	**1**	201	221	273	**54**
Cherkasy	**14**	19,1	19,7	20,0	**20,5**	**29**	169	193	206	**188**
Poltava	**11**	19,3	20,1	20,6	**21,1**	**26**	154	170	199	**168**
Kirovograd	**12**	19,5	20,2	20,4	**20,9**	**16**	152	174	200	**137**
Dnipropetrovs'k	**9**	20,1	21,2	21,8	**22,2**	**18**	130	146	159	**130**
Kharkiv	**9**	19,4	20,2	20,7	**21,5**	**35**	128	143	170	**182**
Svatove	**7**	19,7	20,3	21,0	**21,8**	**1**	133	151	168	**51**
Volnovaha	**8**	19,8	20,8	21,5	**22,3**	**20**	121	142	175	**133**
Odesa	**7**	21,3	21,6	21,8	**22,9**	**25**	98	127	164	**122**
Mykolayiv	**14**	21,7	22,3	22,6	**22,8**	**14**	105	114	131	**98**
Kherson	**11**	21,6	21,9	22,3	**22,8**	**45**	90	105	128	**157**
Zaporizhzh'a	**7**	20,8	21,6	22,0	**22,6**	**24**	119	147	158	**129**
Simferopol'	**16**	20,6	21,4	21,6	**21,7**	**41**	100	135	179	**180**

Rank – 1961 – 2015 (wormest and driest season)

Assessment of the SEECOF-13 Climate outlook for summer 2015

Countru	Sesonal Temprtature (JJA)		Sesonal Precipitation (JJA)		Hight impact Events
	Observed	SEECOF 13 climate outlook	Observed	SEECOF 13 climate outlook	
Ukraine	Above normal most of the country, some places south, center and north normal	Normal and above normal	Below normal most of the country, some places south, center and east normal and above normal	No predictive signal, southeast and east below normal	During the summer season, meteorological extraordinary phenomena in the form of heavy and very heavy rain were observed: on June 25-27 in the northen, central, southen and easten parts (Chernigiv, Symu, Kirovograd, Cherkasu, Poltava, Dnipropetrovs'k, Kharkiv, Mykolayiv, Kherson, Zaporizhzhia, Donets'k and Crimea regions) from 15 to 80 mm of precipitation fell in 5-12 hours. Rainfalls was accompanied by thunderstorms and increased wind speeds of up to 15 - 20 m/s, in Kharkiv regions squally wind 25 m/c and in Dnipropetrovs'k was a tornado. Unfavorable weather conditions caused loss power, telecommunications, utilities and transport.