VERIFICATION OF THE SEECOF–18
WINTER 2017-18 CLIMATE OUTLOOK
AND
SEASONAL BULLETIN
FOR THE TERRITORY OF UKRAINE

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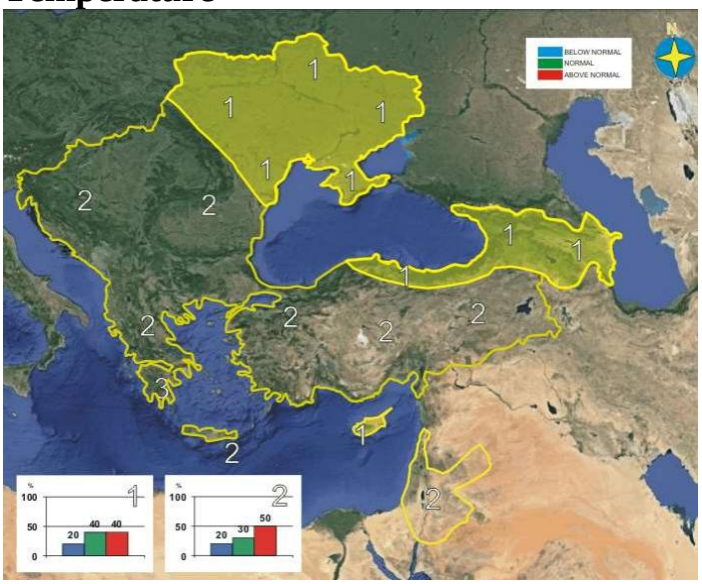
VERIFICATION OF THE SEECOF–18 WINTER 2017-18 CLIMATE OUTLOOK FOR THE TERRITORY OF UKRAINE (1981–2010 BASE PERIOD)

Temperature



According to the SEECOF-18 outlook for the the winter 2017-18 in Ukraine, seasonal temperature 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 winter 2017-18 was warm in Ukraine with above normal temperature based on the tercile method (Figure 1), only some stations (in the west) hit into the normal range.

Verification showed that the temperature reached upper tercile which was indicated in the outlook with the 40% probability.

Note: Tercile analysis of meteorological elements was performed on the basis of the data obtained from 94 main meteorological stations.

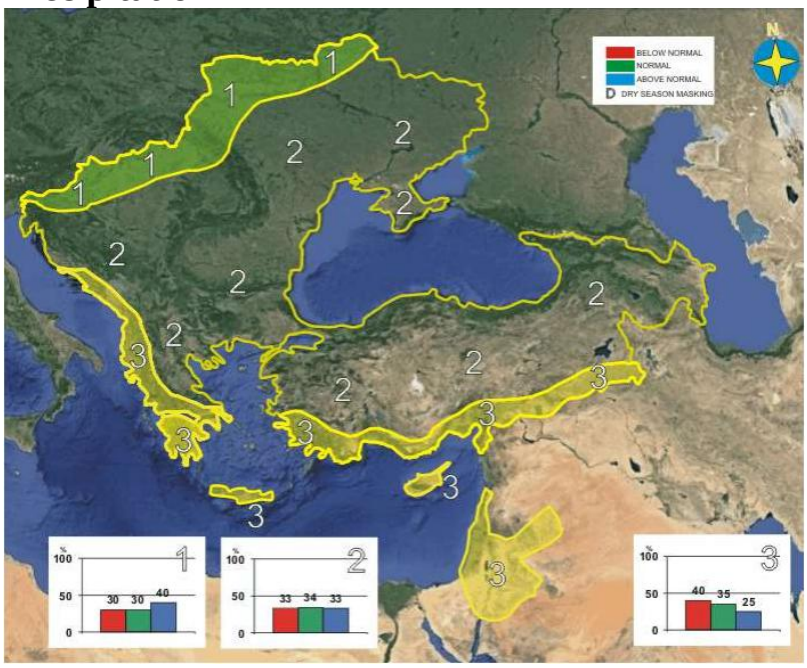
Winter 2017-18			Air Temperature (°C)				
synop		Station	Rank	33	50	66	Observed
1	33526	Ivano-Frankivsk	13	-3.0	-2.2	-1.4	**-0.8**
2	33889	Izmail	10	-0.4	0.4	1.4	**1.8**
3	34415	Izym	7	-4.2	-3.6	-2.8	**-1.0**
4	33998	Ai-Petri	**5**	-3.1	-2.6	-2.2	**-0.7**
5	99915	Askaniya Nova	**3**	-1.5	-0.9	0.0	**1.7**
6	33464	Bila Cerkva	9	-3.5	-2.8	-2.0	**-1.7**
7	34434	Bilovodsk	7	-5.4	-4.3	-3.6	**-1.9**
8	33446	Bilopillya	13	-3.7	-3.1	-2.2	**-2.0**
9	33354	Baryshyvka	10	-3.6	-2.7	-2.3	**-1.8**
10	34717	Berdiyansk	**4**	-1.8	-1.5	-0.9	**1.2**
11	33907	Behtery	**3**	-0.6	-0.2	0.8	**2.5**
12	33717	Bobrynec	**4**	-3.1	-2.6	-1.6	**-0.3**
13	33297	Brody	14	-2.2	-1.8	-0.8	**-0.8**
14	33862	V.Oleksandrivka.	**3**	-2.2	-1.3	-0.6	**1.1**
15	33562	Vinnyca	12	-3.5	-3.3	-2.3	**-1.8**
16	33777	Voznesensk	**5**	-1.8	-1.4	-0.2	**0.9**
17	34615	Volnovaha	**5**	-4.2	-3.7	-3.0	**-1.1**
18	33376	Hadyach	7	-4.4	-3.7	-3.1	**-2.1**
19	33577	Haisyn	13	-3.2	-2.8	-1.8	**-1.3**
20	34407	Hybinyha	**4**	-4.1	-3.4	-2.7	**-0.9**
21	34606	Hylyai Pole	**3**	-3.3	-2.5	-1.9	**0.3**
22	34504	Dnipro	**5**	-3.6	-2.8	-2.4	**-0.6**
23	33524	Dolyna	15	-2.5	-1.5	-0.7	**-0.8**
24	33058	Dryzhba	10	-5.4	-4.5	-4.2	**-3.5**
25	33325	Zhitomyr	12	-3.4	-2.7	-1.9	**-1.4**
26	34601	Zaporizzhya	7	-2.5	-2.1	-1.3	**0.1**
27	33484	Zolotonosha	9	-3.4	-2.5	-2.0	**-1.3**
28	34208	Zolochiv	6	-5.1	-4.4	-3.6	**-2.2**
29	33548	Kamyanec-Podilskiy	13	-3.1	-2.6	-1.1	**-0.8**
30	33983	Kerch	**2**	0.3	1.3	1.9	**3.9**
31	33345	**Kyiv**	10	-3.2	-2.4	-1.9	**-1.5**

32	34609	Kyrylivka	**3**	-3.9	-3.1	-2.4	**-0.3**
33	33621	Kobelyaky	**5**	-3.7	-2.8	-2.5	**-0.8**
34	33173	Kovel	15	-2.2	-1.6	-0.8	**-0.8**
35	33261	Konotop	10	-4.6	-3.7	-3.1	**-2.6**
36	33215	Korosten	12	-3.3	-2.4	-1.7	**-1.6**
37	33299	Kremenec	15	-2.4	-1.9	-1.0	**-0.9**
38	33791	Kryviy Rih	**4**	-3.3	-2.5	-1.8	**-0.1**
39	33711	Kropyvnutsky	**5**	-3.5	-2.9	-2.0	**-0.7**
40	34409	Lozova	6	-4.2	-3.9	-3.3	**-1.4**
41	33377	Lubnu	7	-4.0	-3.2	-2.9	**-1.8**
42	33187	Luck	15	-2.7	-2.1	-1.2	**-1.1**
43	33393	Lviv	14	-2.8	-2.2	-1.2	**-1.1**
44	33761	Liybashivka	13	-3.0	-2.4	-1.1	**-1.0**
45	33075	Lybeshiv	15	-2.4	-1.6	-0.9	**-1.1**
46	33846	Mykolaiv	**4**	-1.7	-1.1	-0.3	**1.2**
47	33663	Mohyliv-Podilskiy	10	-2.1	-1.4	-0.2	**0.2**
48	33312	Novohrad Volynskiy	14	-2.9	-2.3	-1.3	**-1.4**
49	33877	Nyzhni Sirohozy	**3**	-2.1	-1.5	-0.5	**1.1**
50	33557	Nova Ushica	14	-3.4	-2.8	-1.5	**-1.4**
51	33246	Nizhin	10	-4.1	-3.3	-2.8	**-2.3**
52	33837	Odesa	**5**	-0.4	0.1	1.0	**2.3**
53	33203	Olevsk	14	-3.1	-2.4	-1.4	**-1.5**
54	33848	Ochakiv	**3**	-1.2	-0.7	0.1	**1.7**
55	33699	Pervomaisk	6	-2.8	-2.1	-0.8	**0.0**
56	33515	*Play	22	-6.5	-5.9	-5.3	**-5.5**
57	33646	Pozhezhevska	32	-6.2	-5.6	-5.2	**-5.9**
58	33506	Poltava	**5**	-4.3	-3.4	-3.0	**-1.5**
59	33301	Rivne	19	-2.9	-2.3	-1.6	**-2.1**
60	33287	Rava-Ryska	14	-2.4	-1.6	-0.7	**-0.7**
61	33647	Rahiv	7	-2.8	-2.1	-1.7	**-0.2**
62	33268	Romny	8	-4.8	-3.9	-3.5	**-2.4**
63	33946	Simferopol	**2**	0.2	1.1	1.7	**3.8**
64	33896	Sarata	6	-0.9	-0.3	0.8	**1.6**
65	33088	Sarny	13	-2.8	-2.2	-1.2	**-1.2**
66	33614	Svitlovodsk	**5**	-3.0	-2.3	-1.7	**-0.2**

67	33067	Svityaz	15	-2.7	-1.5	-0.7	**-0.6**
68	34421	Svatove	8	-5.0	-4.0	-3.3	**-1.6**
69	33657	Selyatyn	12	-5.2	-4.8	-4.0	**-3.4**
70	33049	Semenivka	10	-4.9	-4.0	-3.6	**-3.1**
71	33833	Serbka	7	-1.9	-1.3	-0.3	**0.6**
72	33516	Slavske	12	-4.4	-3.9	-2.7	**-1.8**
73	33593	Smila	9	-3.8	-2.7	-2.0	**-1.3**
74	33961	Strilcove	**2**	-0.6	0.2	1.0	**2.9**
75	33275	Symy	7	-5.1	-4.5	-3.8	**-2.7**
76	33415	Ternopil	15	-3.5	-2.9	-1.9	**-2.0**
77	33228	Teteriv	10	-3.3	-2.5	-1.7	**-1.6**
78	33511	Tyrka	19	-3.9	-3.4	-1.9	**-2.0**
79	33631	Uzhhorod	8	-1.7	-1.0	0.2	**1.6**
80	33587	Uman	12	-3.6	-2.8	-1.7	**-1.5**
81	34300	Kharkiv	6	-5.2	-3.9	-3.2	**-1.9**
82	33902	Kherson	**3**	-1.7	-0.8	0.1	**1.8**
83	33429	Khmelnitskiy	14	-3.7	-3.2	-1.8	**-1.9**
84	33638	Khyst	**5**	-2.5	-1.8	-0.3	**1.1**
85	33487	Chercasy	8	-3.8	-2.7	-2.1	**-1.3**
86	33658	Chernivci	13	-2.8	-2.1	-0.8	**-0.8**
87	33135	Chernihiv	10	-4.3	-3.0	-2.9	**-2.4**
88	33924	Chornomorske	**2**	1.2	2.0	2.5	**4.4**
89	33536	Chortkiv	12	-3.3	-2.6	-1.4	**-1.3**
90	33317	Shepetivka	16	-3.3	-2.7	-1.7	**-1.9**
91	33136	Snovsk	10	-4.4	-3.4	-3.1	**-2.6**
92	33392	Yavoriv	13	-2.5	-1.9	-0.7	**-0.4**
93	33356	Yahotyn	11	-3.9	-3.0	-2.6	**-2.1**
94	33645	Yaremche	14	-2.5	-2.0	-0.8	**-0.6**

Rank – 1961-2018 (warmest season), *Play – rank 1981-2018

Precipitation



The SEECOF–18 climate outlook indicated equal probabilities for below (33%), near (34%) and above (33%) normal conditions for most of the territory of Ukrain, and above normal conditions (40%) for the west and norht.

Monitoring of precipitation showed wet and normal winter conditions across the country. Most of the territory of Ukraine was in the wet range, in some plases in the western and southeasten part were fixed normal conditions based on the tercile method with 1981–2010 climatological base period (Figure 2).

Verification showed that the precipitations reached above (wet) tercile on most stations and outlook for a wet winter (whith probability 40%) for all territory could be more correct.

Summer 2017			Precipitation (mm)				
synop		Station	Rank	33	50	66	Observed
1	33526	Ivano-Frankivsk	11	83	91	104	**132**
2	33889	Izmail	11	73	84	97	**150**
3	34415	Izym	35	123	137	150	**128**
4	33998	Ai-Petri	30	317	358	427	**363**
5	99915	Askaniya Nova	34	59	84	88	**82**
6	33464	Bila Cerkva	**3**	87	95	114	**182**
7	34434	Bilovodsk	28	104	115	139	**125**
8	33446	Bilopillya	**5**	80	99	103	**144**
9	33354	Baryshyvka	**2**	79	94	105	**176**
10	34717	Berdiyansk	12	108	116	135	**172**
11	33907	Behtery	17	75	84	96	**110**
12	33717	Bobrynec	11	77	95	115	**157**
13	33297	Brody	10	100	113	123	**153**
14	33862	V.Oleksandrivka.	23	72	89	125	**121**
15	33562	Vinnyca	11	77	88	103	**137**
16	33777	Voznesensk	13	64	91	109	**152**
17	34615	Volnovaha	29	121	139	153	**142**
18	33376	Hadyach	**4**	110	128	133	**242**
19	33577	Haisyn	9	88	97	107	**160**
20	34407	Hybinyha	14	105	118	126	**148**
21	34606	Hylyai Pole	35	89	116	125	**96**
22	34504	Dnipro	12	112	120	139	**174**
23	33524	Dolyna	**2**	90	102	118	**219**
24	33058	Dryzhba	**3**	112	121	148	**217**
25	33325	Zhitomyr	**2**	81	103	107	**188**
26	34601	Zaporizzhya	31	103	115	139	**114**
27	33484	Zolotonosha	**3**	94	104	117	**236**
28	34208	Zolochiv	8	101	116	133	**182**
29	33548	Kamyanec-Podilskiy	38	83	97	115	**86**
30	33983	Kerch	40	86	105	120	**86**
31	33345	Kyiv	6	110	119	127	**212**

32	34609	Kyrylivka	24	121	136	149	**146**
33	33621	Kobelyaky	14	88	113	127	**146**
34	33173	Kovel	26	92	103	120	**114**
35	33261	Konotop	**2**	100	115	125	**236**
36	33215	Korosten	**5**	85	99	102	**155**
37	33299	Kremenec	7	101	111	122	**165**
38	33791	Kryviy Rih	16	68	83	93	**123**
39	33711	Kropyvnutsky	6	76	82	101	**154**
40	34409	Lozova	29	108	118	130	**123**
41	33377	Lubnu	**2**	115	129	141	**268**
42	33187	Luck	6	70	83	95	**140**
43	33393	Lviv	**5**	113	120	145	**192**
44	33761	Liybashivka	8	74	87	107	**164**
45	33075	Lybeshiv	7	105	116	122	**134**
46	33846	Mykolaiv	23	68	88	109	**111**
47	33663	Mohyliv-Podilskiy	32	69	85	99	**90**
48	33312	Novohrad Volynskiy	28	106	119	131	**128**
49	33877	Nyzhni Sirohozy	29	76	87	107	**94**
50	33557	Nova Ushica	40	88	100	116	**91**
51	33246	Nizhin	**4**	105	118	127	**223**
52	33837	Odesa	7	81	102	120	**203**
53	33203	Olevsk	7	102	115	126	**169**
54	33848	Ochakiv	11	65	85	97	**141**
55	33699	Pervomaisk	4	81	106	113	**215**
56	33515	*Play	17	265	299	358	**393**
57	33646	Pozhezhevska	**3**	208	227	251	**513**
58	33506	Poltava	10	93	118	126	**182**
59	33301	Rivne	9	73	80	92	**129**
60	33287	Rava-Ryska	8	95	112	120	**156**
61	33647	Rahiv	24	229	245	321	**289**
62	33268	Romny	**3**	90	122	135	**256**
63	33946	Simferopol	28	99	125	140	**120**
64	33896	Sarata	9	66	85	101	**156**
65	33088	Sarny	6	86	96	108	**147**
66	33614	Svitlovodsk	13	78	93	102	**135**

67	33067	Svityaz	27	89	96	108	**105**
68	34421	Svatove	24	100	119	133	**134**
69	33657	Selyatyn	11	78	90	102	**126**
70	33049	Semenivka	**1**	100	125	131	**220**
71	33833	Serbka	**5**	61	79	84	**152**
72	33516	Slavske	**1**	149	163	177	**306**
73	33593	Smila	**2**	83	105	113	**243**
74	33961	Strilcove	23	79	90	99	**100**
75	33275	Symy	**4**	85	106	116	**202**
76	33415	Ternopil	15	77	89	96	**118**
77	33228	Teteriv	**5**	97	109	118	**186**
78	33511	Tyrka	**5**	153	165	179	**239**
79	33631	Uzhhorod	12	159	187	203	**215**
80	33587	Uman	6	92	108	123	**207**
81	34300	Kharkiv	11	90	96	116	**149**
82	33902	Kherson	31	76	88	104	**87**
83	33429	Khmelnitskiy	33	86	102	112	**102**
84	33638	Khyst	25	259	277	325	**305**
85	33487	Chercasy	**3**	79	95	101	**209**
86	33658	Chernivci	16	69	86	91	**120**
87	33135	Chernihiv	6	97	120	128	**195**
88	33924	Chornomorske	37	68	76	93	**76**
89	33536	Chortkiv	14	90	102	117	**138**
90	33317	Shepetivka	13	107	111	125	**146**
91	33136	Snovsk	**3**	102	126	135	**217**
92	33392	Yavoriv	13	117	136	157	**172**
93	33356	Yahotyn	**1**	75	96	108	**214**
94	33645	Yaremche	5	93	109	110	**167**

Rank – 1961-2018 (Wettest season), *Play – rank 1981-2018

Assessment of the SEECOF-18 Climate outlook for winter 2017-18

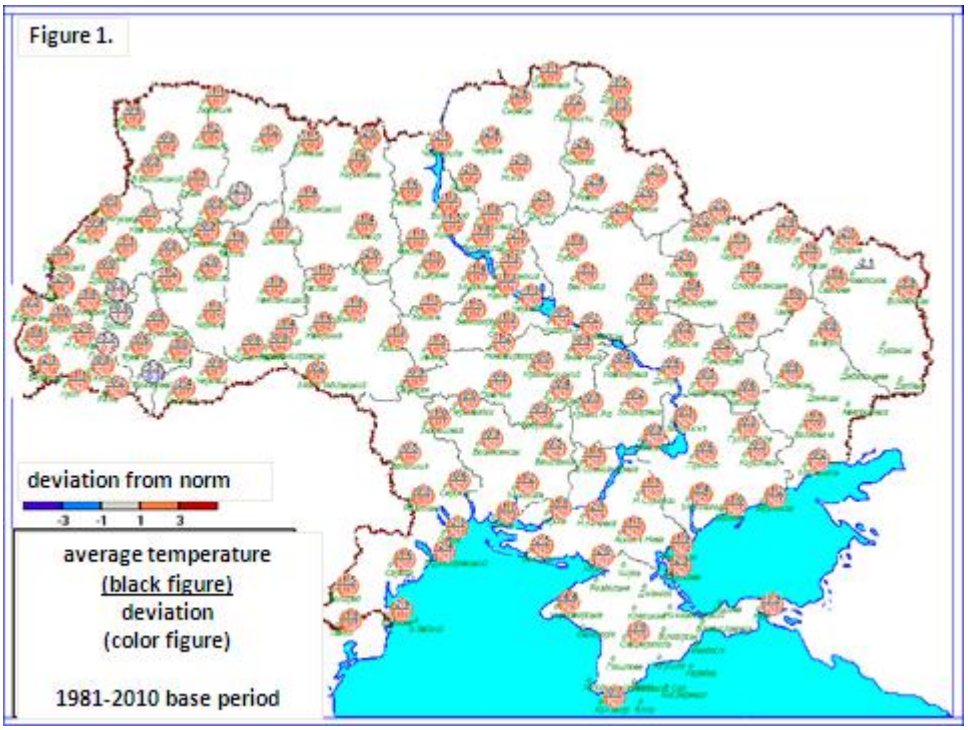
Countru	Sesonal Temperature (DJF)		Sesonal Precipitation (DJF)		Hight impact Events
	Observed	SEECOF-18 climate outlook	Observed	SEECOF-18 climate outlook	
Ukraine	**above** normal (83% stations) and **normal** (17% stations)	Normal and above normal	**above** normal (74,5% stations) and **normal** (25,5% stations)	No predictive signal and above normal (west, north)	During the winter season, meteorological extraordinary phenomenas were observed in many regions of the country. **In December** 15-16th were recorded very heavy snowfalls (20-36 mm precipitation per 6-12 hours) and rains (32-42 mm per 12 hours) in Zakarpattya and Ivano-Frankivsk regions; 18-19th very heavy snowfalls (21-36 mm/12 hours) in Kyiv, Zhytomyr, Cherkasy regions. Desember was the warmest in the history of observations in the eastern part of country. **In January** 17-18th were recorded very heavy snowfalls (20-45 mm/6-12 hours) in Kyiv, Chernihiv, Symy, Kirovograd, Chercasy, Odesa regions; very heavy rains (51 mm/12 hours) and strong wind (gust 25-29 m/c) in Odesa region. **In February** 26-28th were recorded very heavy snowfalls (20-27 mm/12 hours) in Odesa region; strong wind (gust 25-28 m/c) in Donetsk, Zaporizzhya, Kherson, Odesa regions and strong blizzard (for 14-23 hours with wind gust 15-27 m/c) in Mykolaiv and Odesa regions. Unfavorable weather conditions caused loss power, telecommunications, utilities and transport. Winter was wet, but in some regions (Lviv, Kyiv, Chernihiv regions) were stations with wettest winter conditions since 1961, were recorded 214-306 mm (176..223% of the norm).

Analysis of the winter season 2017-18 for Ukraine compared to the 1981-2010 base period

Temperature

The average air temperature during winter 2017-18 was in the range from –3,7°C in the northeast to +2.9°C in the sourthwest of Ukraine, in Crimea was +3,8..+4,4°C and on highlands of the Carpathian mountains was –5,5.. –5,9°C.

Deviations the mean air winter temperature from average values of the 1981-2010 base period were +1,2..+2,9°C, in local places of the west were deviations –0,3..+1,0°C (Figure.1).



Note: Climatological analysis of meteorological elements was performed on the basis of the data obtained from 163 meteorological stations.

From month to month average temperature deviation was inhomogeneous compared to the average values of the 1981-2010 base period.

December was **anomaly warm** with deviations (+3…+6.7°C) for most of the territory of Ukraine, in the Zakarpattya region were warm conditions with deviations +2…+3°C.

In January, the temperature conditions were close to the average values across the country with slight positive deviations in the range +0.2 ... + 1,7°C, only in the west were warm conditions with deviations +2,0…+4,1°C.

February was cold in the west with negative deviations –1,2…–2,9 °C and warm in the southeast (including the Crimea) whith positive deviations +1,1… +2,0°C, on the rest of the country the temperature conditions were close to norm (–1,0…+1,0 °C).

The minimum temperature ranged from –27,0°C in Sumy region (northeast of the country) to –12.0°C on the coast of the sea in Odessa region (southwest) and to –11,3°C in Zakarpattya region (west) (Figure 2).

The lowest air temperature during winter 2017-18, measuring –27,0°C was observed on 27th of February in Hlukhiv of Sumy region.

Winter 2017-18 was warm and the minimum temperatures were mostly in the range –5 …–16°C,only on separate days declined to –20… –27°C .

Absolute minimum winter temperatures recorded in the history of observations are –27…–42°C, in the south of country and Transcarpathia region –23…–34 °C.

The lowest temperatures in winter seasons have been recorded since 2000 are –23…–35°C, in the south of country and Transcarpathia region –23…–34 °C.

In most regions (west, north, center and east) there is an increase in the minimum temperatures but in the south and Transcarpathian region, the minimum temperatures do not rise like this on the rest of Ukraine.

Maximum temperature was in the range from +8,3°C in Zhitomyr region (north) to +17,3°C in Odesa region (southwest) and to +20,6°C in the Crimea (south). In Carpathian mountains (highlands) +4,3...+5,6°C (Figure 3).

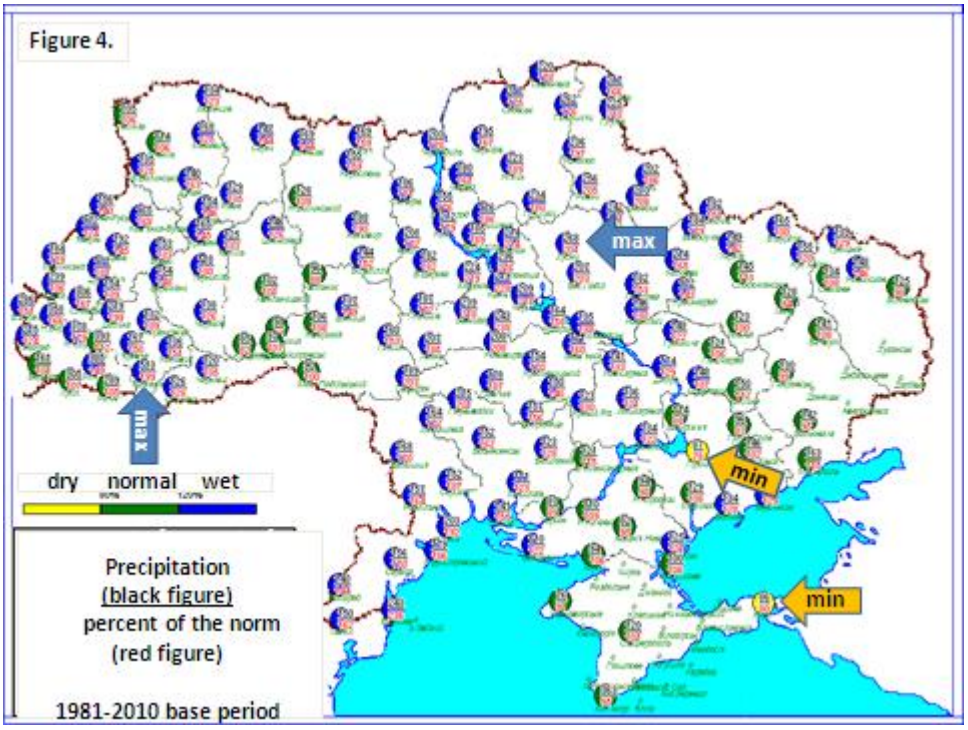
The highest daily air temperature during the winter 2017-18, measuring +20,6°C was observed on 2th of December in Simferopol in the Crimea.

December was warmest month in the winter season 2017-18.
In the eastern part of country (Kharkiv, Luhansk, Donetsk, Sumy, Poltava, Dnipro, Zaporizzhya, Kherson regions) December was warmest month in the history of observations.

Absolute maximum winter temperatures recorded in the history of observations are +10…+18°C, in the south and west part of Ukraine +19..+24°C.

Precipitation

In the winter 2017-18 were dominanted wet conditions (123..238% of the norm), but in the western and southeasten parts was normal moisture (80..120%), and only two stations had some dry conditions (78…80%) compared to the average values of the 1981-2010 base period (Figure.4).



Seasonal precipitation was ranged from 86..87 mm (78-80% of the norm) in the Crimea (Kerch) and Zaporizzhya region (Hylyai Pole) to 268 mm (238%) in the Poltava region (Lubny) and 286…513 mm in Carpathian region (whith maximum in Pozhezhevska) (Figure 4).

The biggest daily presipitation was recorded in Odessa (sourthwest of the country) – 54 mm on 18 th of January.

Most of the winter precipitation was associated with active cyclones that migrated to the territory of Ukraine from Central Europe and Balkan Peninsula (16-19th of December,17-23th of January, 4-10th and 27-28th of February).

From month to month the winter precipitation was not homogeneous.
December was wet on most areas, the month presipitation were 120…350% of norm, except southeastern part where were dry conditions 40…75%.

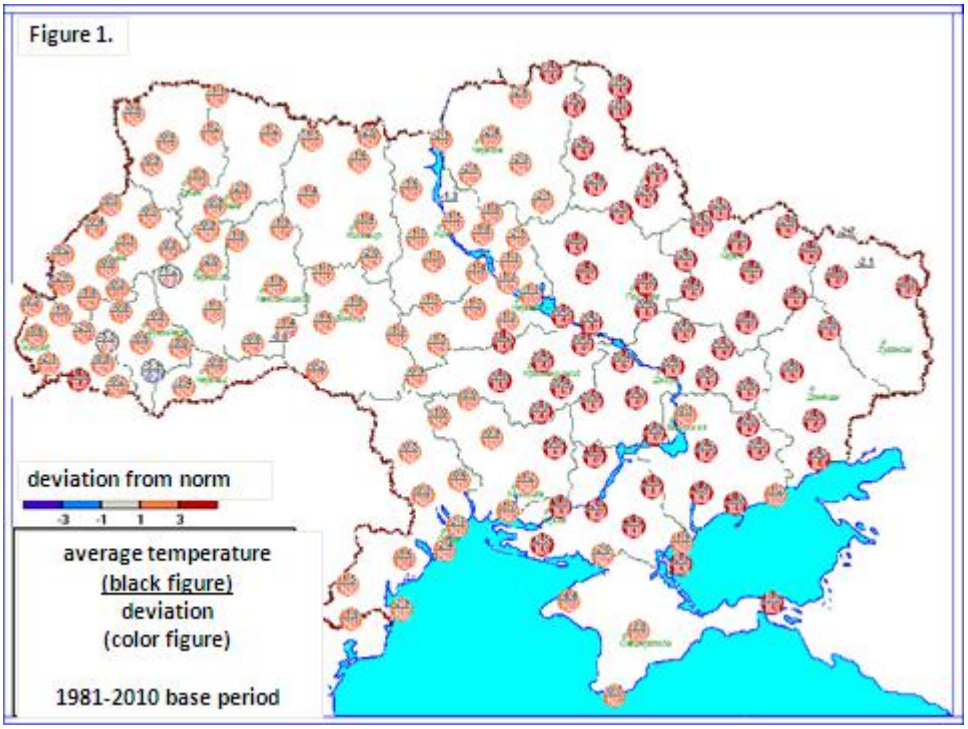
In January the moistening reduced (80…230%, in some places 40…75%) and distributed extremely unemely across the territory of the country.

February was mostly normal moistened (80…120%) and in some regions were 120…225%, in the southwest (south of Odesa region) 310…370%.

Analysis of the winter season 2017-18 for Ukraine compared to the 1961-1990 base period

Temperature

Deviations of the mean air temperature were +2..3,7°C above the climate norm (1961-1990) (Figure 1).

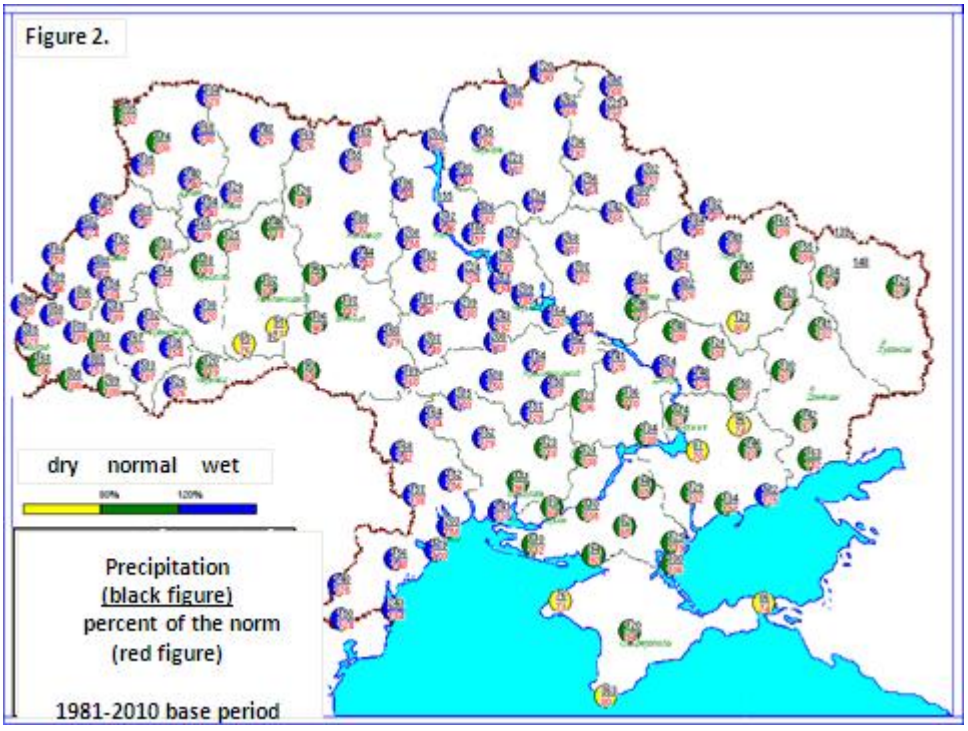


According to the tercile method (with 1961–1990 climatological norm), mean air temperature in the winter 2017-18 was in the warm category.

Precipitation

Most stations recorded normal and excess moisture (80…190%) compared to the 1961-1990 climate norm, but in the western and southeasten part were places with some dry conditions (70…80%) (Figure 2).

According to the tercile method (with 1961–1990 climatological norm), winter 2017-18 presipitation were in the normal and wet category.



During the winer 2017-18 maximum and minimum daily temperatures at most stations of Ukraine remained in the range of recorded daily absolute temperatures (min...max).
Only on separate days the maximum temperatures approached and reached fixed absolute values.
Graphs with minimum and maximum temperatures for selected cities listed below (Figure. 3, 4, 5, 6, 7).

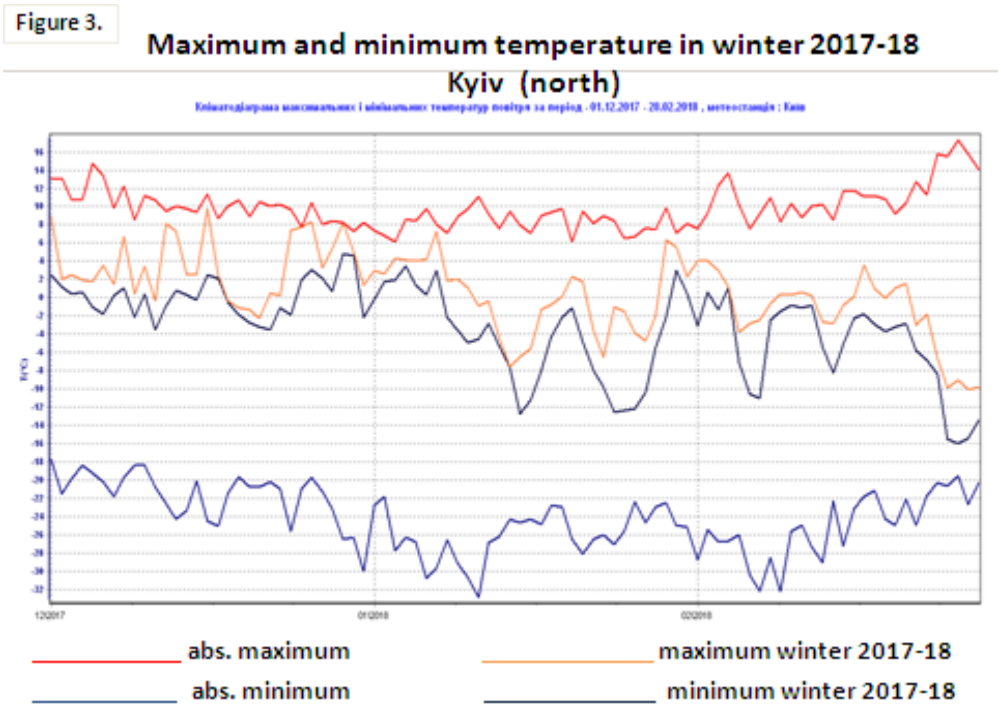
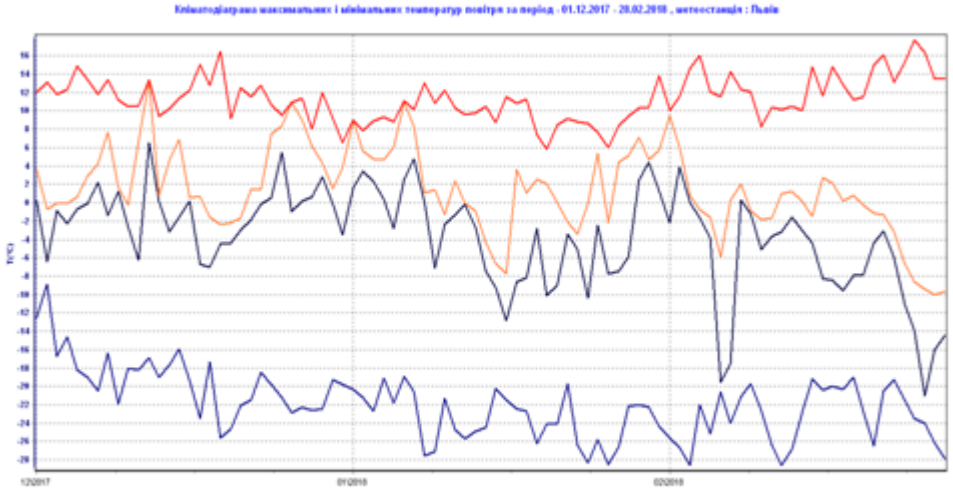


Figure 4.

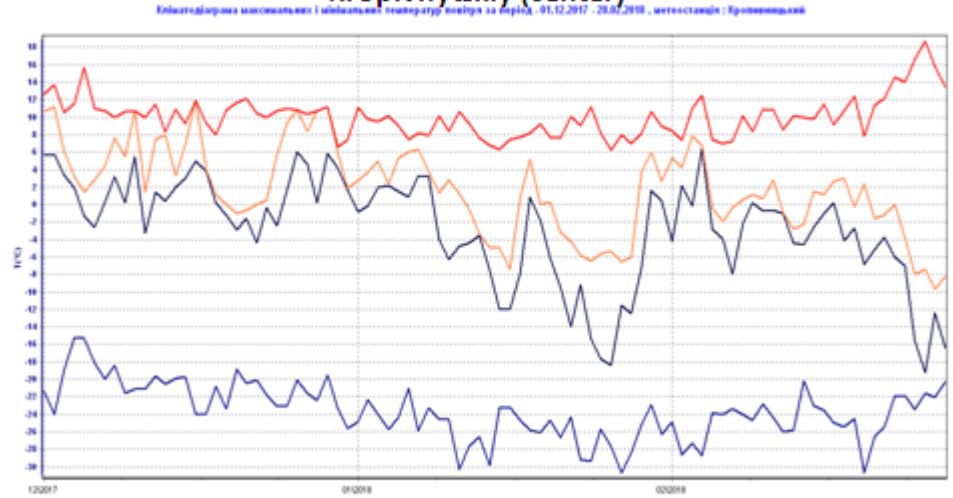
Maximum and minimum temperature in winter 2017-18
L'viv (west)



abs. maximum
maximum winter 2017-18
abs. minimum
minimum winter 2017-18

Figure 5.

Maximum and minimum temperature in winter 2017-18
Kropivnytskiy (center)

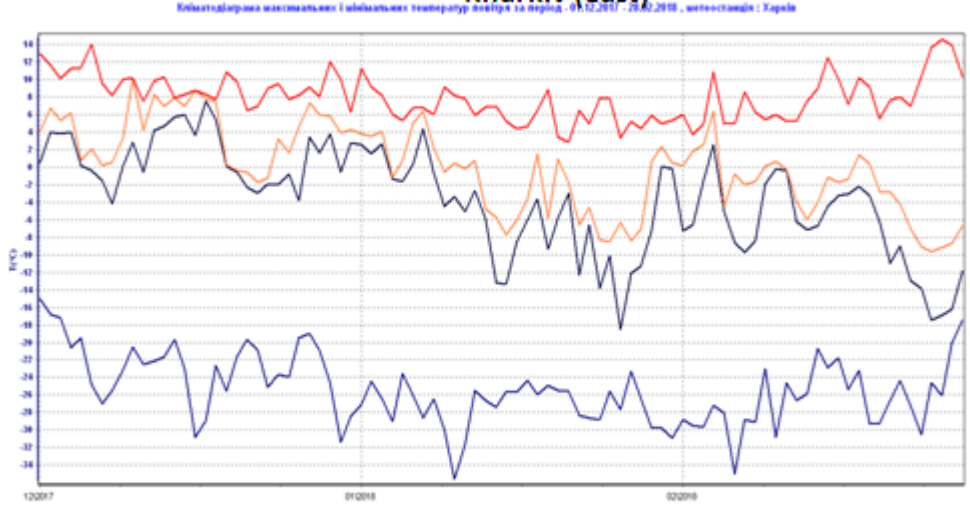


abs. maximum
maximum winter 2017-18
abs. minimum
minimum winter 2017-18

Figure 6.

Maximum and minimum temperature in winter 2017-18

Kharkiv (east)



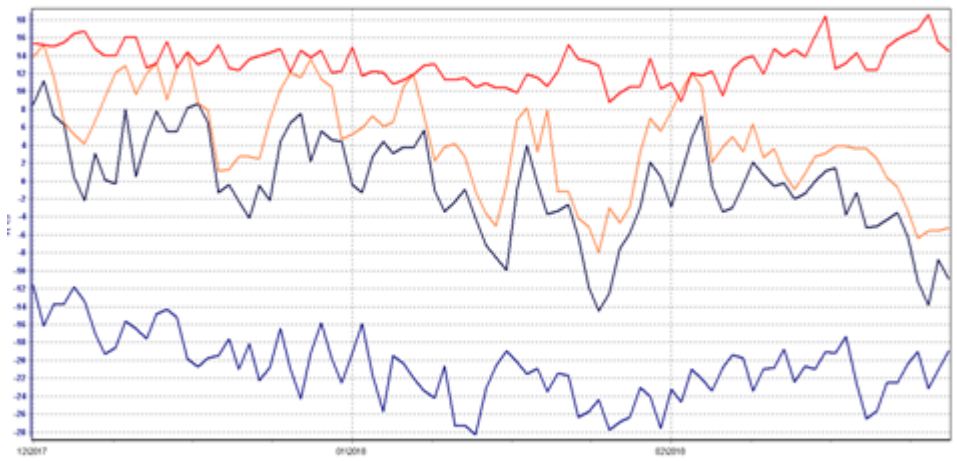
abs. maximum — maximum winter 2017-18

abs. minimum — minimum winter 2017-18

Figure 7.

Maximum and minimum temperature in winter 2017-18

Kherson (south)



abs. maximum — maximum winter 2017-18

abs. minimum — minimum winter 2017-18