VERIFICATION OF THE SEECOF–24
WINTER 2020 – 2021 CLIMATE OUTLOOK
AND
SEASONAL BULLETIN
FOR THE TERRITORY OF UKRAINE

Kyiv, 16 April 2021

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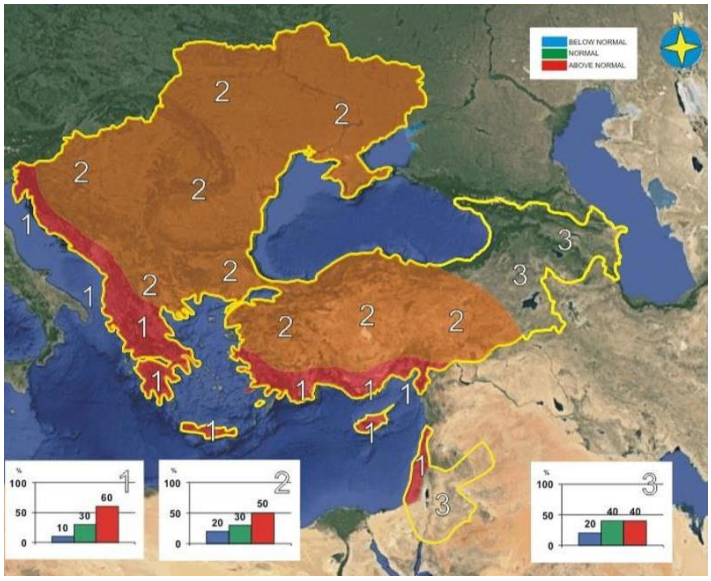
VERIFICATION OF THE SEECOF–24 WINTER 2020-21 CLIMATE OUTLOOK FOR THE TERRITORY OF UKRAINE (1981–2010 BASE PERIOD)

Temperature



According to the SEECOF-24 outlook for the the winter 2020-21 in Ukraine, seasonal temperature was expected warmer (upper tercile) with probabilyty 50%, normal with probability 30% and below (low tercile) with probability (20%) compared to the 1981–2010 climatological base period.

Climatological monitoring showed that the winter 2020-21 was warm in southern, southwestern and soootheastern parts of Ukraine, in the rest of the territory were normal conditions based on the tercile method (Figure 1.).

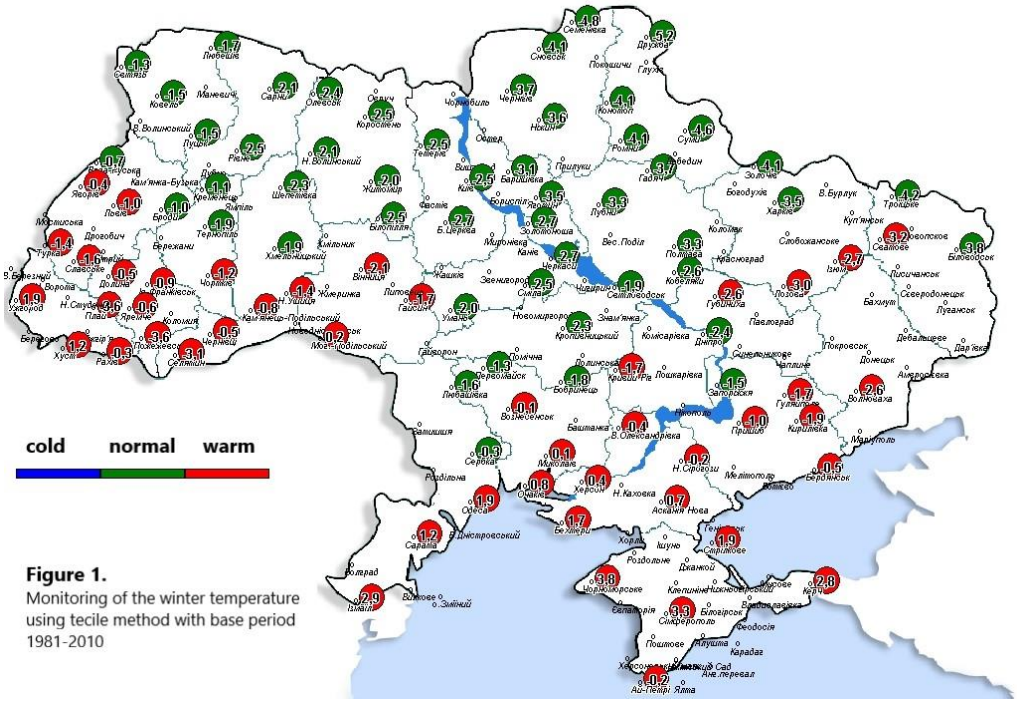


Figure 1.
Monitoring of the winter temperature using tecile method with base period 1981-2010

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

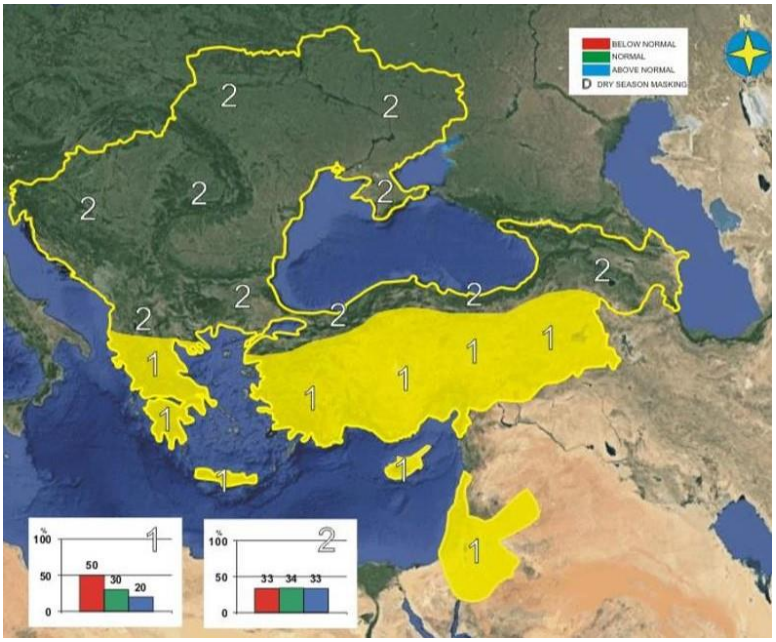
Winter 2020-21			Air Temperature (°C)				
synop		Station	Rank	33	50	66	Observed
1	33526	Ivano-Frankivsk	15	-3,0	-2,2	-1,4	-0,9
2	33889	Izmail	3	-0,4	0,4	1,4	2,9
3	34415	Izym	20	-4,2	-3,6	-2,8	-2,7
4	33998	Ai-Petri	3	-3,1	-2,6	-2,2	-0,2
5	99915	Askaniya Nova	10	-1,5	-0,9	0,0	0,7
6	33464	Bila Cerkva	23	-3,5	-2,8	-2,0	-2,7
7	34434	Bilovodsk	22	-5,4	-4,3	-3,6	-3,8
8	33446	Bilopillya	19	-3,7	-3,1	-2,2	-2,5
9	33354	Baryshyvka	27	-3,6	-2,7	-2,3	-3,1
10	34717	Berdiyansk	19	-1,8	-1,5	-0,9	-0,5
11	33907	Behtery	8	-0,6	-0,2	0,8	1,7
12	33717	Bobrynec	20	-3,1	-2,6	-1,6	-1,8
13	33297	Brody	19	-2,2	-1,8	-0,8	-1,0
14	33862	V.Oleksandrivka.	16	-2,2	-1,3	-0,6	-0,4
15	33562	Vinnyca	16	-3,5	-3,3	-2,3	-2,1
16	33777	Voznesensk	17	-1,8	-1,4	-0,2	-0,1
17	34615	Volnovaha	18	-4,2	-3,7	-3,0	-2,6
18	33376	Hadyach	25	-4,4	-3,7	-3,1	-3,7
19	33577	Haisyn	16	-3,2	-2,8	-1,8	-1,7
20	34407	Hybinyha	19	-4,1	-3,4	-2,7	-2,6
21	34606	Hylyai Pole	19	-3,3	-2,5	-1,9	-1,7
22	34504	Dnipro	20	-3,6	-2,8	-2,4	-2,4
23	33524	Dolyna	16	-2,5	-1,5	-0,7	-0,5
24	33058	Dryzhba	31	-5,4	-4,5	-4,2	-5,2
25	33325	Zhitomyr	18	-3,4	-2,7	-1,9	-2,0
26	34601	Zaporizzhya	21	-2,5	-2,1	-1,3	-1,5
27	33484	Zolotonosha	26	-3,4	-2,5	-2,0	-2,7
28	34208	Zolochiv	23	-5,1	-4,4	-3,6	-4,1
29	33548	Kamyanec-Podilskiy	17	-3,1	-2,6	-1,1	-0,8
30	33983	Kerch	11	0,3	1,3	1,9	2,8
31	33345	**Kyiv**	24	-3,2	-2,4	-1,9	-2,5
32	34609	Kyrylivka	17	-3,9	-3,1	-2,4	-1,9

33	33621	Kobelyaky	21	-3,7	-2,8	-2,5	-2,6
34	33173	Kovel	23	-2,2	-1,6	-0,8	-1,5
35	33261	Konotop	29	-4,6	-3,7	-3,1	-4,1
36	33215	Korosten	23	-3,3	-2,4	-1,7	-2,5
37	33299	Kremenec	18	-2,4	-1,9	-1,0	-1,1
38	33791	Kryviy Rih	17	-3,3	-2,5	-1,8	-1,7
39	33711	Kropyvnutsky	21	-3,5	-2,9	-2,0	-2,3
40	34409	Lozova	19	-4,2	-3,9	-3,3	-3,0
41	33377	Lubnu	26	-4,0	-3,2	-2,9	-3,3
42	33187	Luck	20	-2,7	-2,1	-1,2	-1,5
43	33393	Lviv	16	-2,8	-2,2	-1,2	-1,0
44	33761	Liybashivka	19	-3,0	-2,4	-1,1	-1,6
45	33075	Lybeshiv	24	-2,4	-1,6	-0,9	-1,7
46	33846	Mykolaiv	15	-1,7	-1,1	-0,3	0,1
47	33663	Mohyliv-Podilskiy	11	-2,1	-1,4	-0,2	0,2
48	33312	Novohrad Volynskiy	20	-2,9	-2,3	-1,3	-2,1
49	33877	Nyzhni Sirohozy	15	-2,1	-1,5	-0,5	-0,2
50	33557	Nova Ushica	15	-3,4	-2,8	-1,5	-1,4
51	33246	Nizhin	25	-4,1	-3,3	-2,8	-3,6
52	33837	Odesa	8	-0,4	0,1	1,0	1,9
53	33203	Olevsk	22	-3,1	-2,4	-1,4	-2,4
54	33848	Ochakiv	14	-1,2	-0,7	0,1	0,8
55	33699	Pervomaisk	19	-2,8	-2,1	-0,8	-1,3
56	33515	*Play	3	-6,5	-5,9	-5,3	-3,6
57	33646	Pozhezhevska	6	-6,2	-5,6	-5,2	-3,6
58	33506	Poltava	25	-4,3	-3,4	-3,0	-3,3
59	33301	Rivne	26	-2,9	-2,3	-1,6	-2,5
60	33287	Rava-Ryska	16	-2,4	-1,6	-0,7	-0,7
61	33647	Rahiv	9	-2,8	-2,1	-1,7	-0,3
62	33268	Romny	28	-4,8	-3,9	-3,5	-4,1
63	33946	Simferopol	4	0,2	1,1	1,7	3,3
64	33896	Sarata	14	-0,9	-0,3	0,8	1,2
65	33088	Sarny	22	-2,8	-2,2	-1,2	-2,1
66	33614	Svitlovodsk	21	-3,0	-2,3	-1,7	-1,9

67	33067	Svityaz	23	-2,7	-1,5	-0,7	-1,3
68	34421	Svatove	19	-5,0	-4,0	-3,3	-3,2
69	33657	Selyatyn	11	-5,2	-4,8	-4,0	-3,1
70	33049	Semenivka	31	-4,9	-4,0	-3,6	-4,8
71	33833	Serbka	18	-1,9	-1,3	-0,3	-0,3
72	33516	Slavske	11	-4,4	-3,9	-2,7	-1,6
73	33593	Smila	25	-3,8	-2,7	-2,0	-2,5
74	33961	Strilcove	8	-0,6	0,2	1,0	1,9
75	33275	Symy	28	-5,1	-4,5	-3,8	-4,6
76	33415	Ternopil	17	-3,5	-2,9	-1,9	-1,9
77	33228	Teteriv	23	-3,3	-2,5	-1,7	-2,5
78	33511	Tyrka	13	-3,9	-3,4	-1,9	-1,4
79	33631	Uzhhorod	5	-1,7	-1,0	0,2	1,9
80	33587	Uman	19	-3,6	-2,8	-1,7	-2,0
81	34300	Kharkiv	22	-5,2	-3,9	-3,2	-3,5
82	33902	Kherson	11	-1,7	-0,8	0,1	0,4
83	33429	Khmelnitskiy	15	-3,7	-3,2	-1,8	-1,9
84	33638	Khyst	6	-2,5	-1,8	-0,3	1,2
85	33487	Chercasy	25	-3,8	-2,7	-2,1	-2,7
86	33658	Chernivci	12	-2,8	-2,1	-0,8	-0,5
87	33135	Chernihiv	27	-4,3	-3,0	-2,9	-3,7
88	33924	Chornomorske	8	1,2	2,0	2,5	3,8
89	33536	Chortkiv	13	-3,3	-2,6	-1,4	-1,2
90	33317	Shepetivka	20	-3,3	-2,7	-1,7	-2,3
91	33136	Snovsk	29	-4,4	-3,4	-3,1	-4,1
92	33392	Yavoriv	15	-2,5	-1,9	-0,7	-0,4
93	33356	Yahotyn	28	-3,9	-3,0	-2,6	-3,5
94	33645	Yaremche	15	-2,5	-2,0	-0,8	-0,6

Rank – 1961-2020 (warmest season), *Play – rank 1981-2020

Precipitation



The SEECOF–24 climate outlook indicated equal probabilities for below (33%), normal (34%) and above normal (33%) conditions for the territory of Ukrain.

Monitoring of precipitation showed wet and normal conditions in most of the country. (Figure 2). Dry conditions were fixed only in some plases in the eastern part of Ukraine (tercile method with 1981–2010 climatological base period).

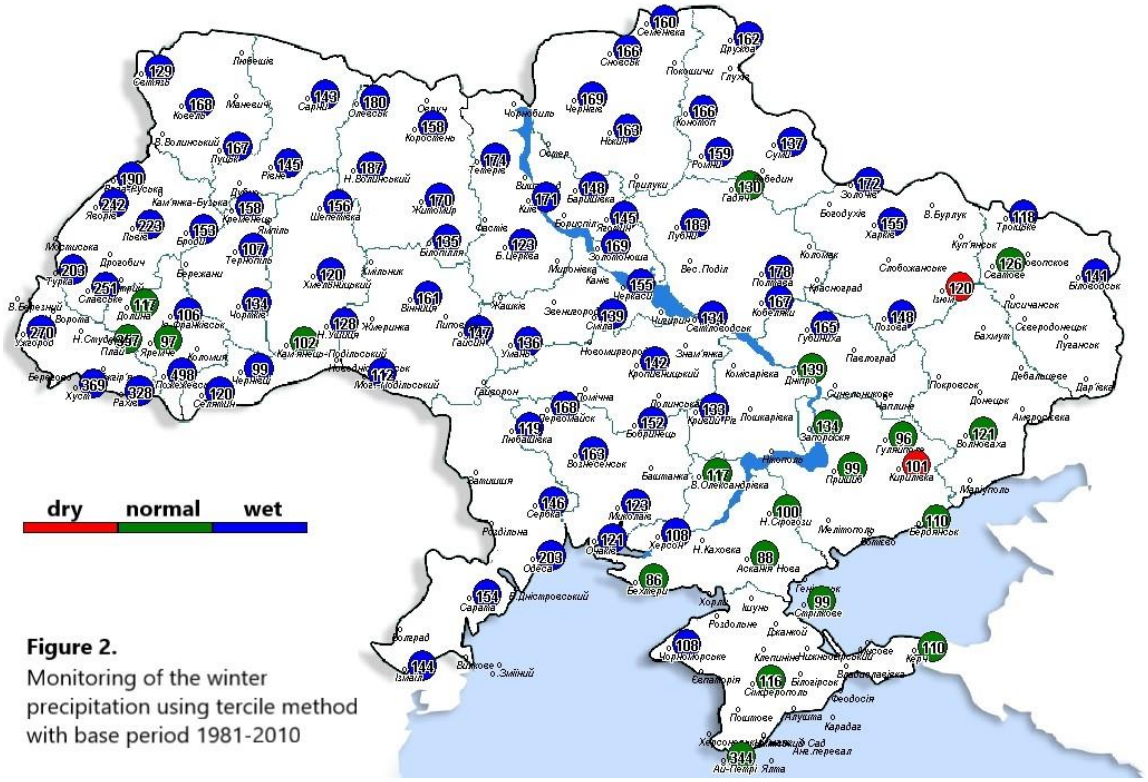


Figure 2.
Monitoring of the winter precipitation using tercile method with base period 1981-2010

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

Winter 2019-20			Precipitation (mm)				
synop		Station	Rank	33	50	66	Observed
1	33526	Ivano-Frankivsk	21	83	91	104	106
2	33889	Izmail	13	73	84	97	144
3	34415	Izym	40	123	137	150	120
4	33998	Ai-Petri	37	317	358	427	344
5	99915	Askaniya Nova	29	59	84	88	88
6	33464	Bila Cerkva	18	87	95	114	123
7	34434	Bilovodsk	26	104	115	139	141
8	33446	Bilopillya	6	80	99	103	135
9	33354	Baryshyvka	6	79	94	105	148
10	34717	Berdiyansk	42	108	116	135	110
11	33907	Behtery	33	75	84	96	86
12	33717	Bobrynec	12	77	95	115	152
13	33297	Brody	11	100	113	123	153
14	33862	V.Oleksandrivka.	25	72	89	125	117
15	33562	Vinnyca	6	77	88	103	161
16	33777	Voznesensk	12	64	91	109	163
17	34615	Volnovaha	42	121	139	153	121
18	33376	Hadyach	30	110	128	133	130
19	33577	Haisyn	14	88	97	107	147
20	34407	Hybinyha	10	105	118	126	165
21	34606	Hylyai Pole	37	89	116	125	96
22	34504	Dnipro	25	112	120	139	139
23	33524	Dolyna	27	90	102	118	117
24	33058	Dryzhba	15	112	121	148	162
25	33325	Zhitomyr	**4**	81	103	107	170
26	34601	Zaporizzhya	23	103	115	139	134
27	33484	Zolotonosha	8	94	104	117	169
28	34208	Zolochiv	11	101	116	133	172
29	33548	Kamyanec-Podilskiy	30	83	97	115	102
30	33983	Kerch	30	86	105	120	110
31	33345	Kyiv	9	110	119	127	171
32	34609	Kyrylivka	48	121	136	149	101
33	33621	Kobelyaky	13	88	113	127	167

34	33173	Kovel	**3**	92	103	120	168
35	33261	Konotop	12	100	115	125	166
36	33215	Korosten	4	85	99	102	158
37	33299	Kremenec	8	101	111	122	158
38	33791	Kryviy Rih	12	68	83	93	133
39	33711	Kropyvnutsky	10	76	82	101	142
40	34409	Lozova	13	108	118	130	148
41	33377	Lubnu	11	115	129	141	183
42	33187	Luck	**3**	70	83	95	167
43	33393	Lviv	**4**	113	120	145	223
44	33761	Liybashivka	20	74	87	107	119
45	33075	Lybeshiv	**3**	105	116	122	156
46	33846	Mykolaiv	16	68	88	109	123
47	33663	Mohyliv-Podilskiy	22	69	85	99	112
48	33312	Novohrad Volynskiy	7	106	119	131	187
49	33877	Nyzhni Sirohozy	26	76	87	107	100
50	33557	Nova Ushica	20	88	100	116	128
51	33246	Nizhin	9	105	118	127	163
52	33837	Odesa	7	81	102	120	203
53	33203	Olevsk	6	102	115	126	180
54	33848	Ochakiv	19	65	85	97	121
55	33699	Pervomaisk	12	81	106	113	168
56	33515	*Play	23	265	299	358	357
57	33646	Pozhezhevska	**5**	208	227	251	498
58	33506	Poltava	11	93	118	126	178
59	33301	Rivne	**3**	73	80	92	145
60	33287	Rava-Ryska	**2**	95	112	120	190
61	33647	Rahiv	17	229	245	321	328
62	33268	Romny	17	90	122	135	159
63	33946	Simferopol	35	99	125	140	116
64	33896	Sarata	10	66	85	101	154
65	33088	Sarny	9	86	96	108	143
66	33614	Svitlovodsk	15	78	93	102	134
67	33067	Svityaz	14	89	96	108	129

68	34421	Svatove	30	100	119	133	126
69	33657	Selyatyn	16	78	90	102	120
70	33049	Semenivka	9	100	125	131	160
71	33833	Serbka	9	61	79	84	146
72	33516	Slavske	10	149	163	177	251
73	33593	Smila	15	83	105	113	139
74	33961	Strilcove	27	79	90	99	99
75	33275	Symy	16	85	106	116	137
76	33415	Ternopil	21	77	89	96	107
77	33228	Teteriv	6	97	109	118	174
78	33511	Tyrka	11	153	165	179	203
79	33631	Uzhhorod	**4**	159	187	203	270
80	33587	Uman	22	92	108	123	136
81	34300	Kharkiv	11	90	96	116	155
82	33902	Kherson	20	76	88	104	108
83	33429	Khmelnitskiy	21	86	102	112	120
84	33638	Khyst	10	259	277	325	369
85	33487	Chercasy	8	79	95	101	155
86	33658	Chernivci	24	69	86	91	99
87	33135	Chernihiv	7	97	120	128	169
88	33924	Chornomorske	23	68	76	93	108
89	33536	Chortkiv	16	90	102	117	134
90	33317	Shepetivka	10	107	111	125	156
91	33136	Snovsk	11	102	126	135	166
92	33392	Yavoriv	**3**	117	136	157	242
93	33356	Yahotyn	8	75	96	108	145
94	33645	Yaremche	39	93	109	110	97

Rank – 1961-2020 (Wettest season), *Play – rank 1981-2020

Assessment of the SEECOF-24 Climate outlook for winter 2020-21

Countru	Sesonal Temperature (DJF)		Sesonal Precipitation (DJF)		Hight impact Events
	Observed	SEECOF-24 climate outlook	Observed	SEECOF-24 climate outlook	
Ukraine	**normal** (53% stations) **and** **above** normal (47% stations)	**above normal (50%)**	**above** normal (78% stations) **normal** (20% stations) **below** normal (2% stations)	**above (33%)** **normal (34%)** **below (33%)**	Meteorological extraordinary phenomena were observed in **December 29**th - strong wind 26-27m/c in Ivano-Frankivsk region. **In January** 26-28th were recorded **heavy snowfalls** (20-36 mm precipitation per 12 hours) and strong blizzard (for 12 hours with wind gust 15-25 m/c) in Odesa and Mykolaiv regions. **In Fabruary** 9-12 th were recorded **heavy snowfalls** (20-22 mm precipitation per 10-12 hours) in Zakarpattia, Lviv and Ternopil regions; on 12 th of February **strong wind** 25 m/c in southern part Odesa region. Unfavorable weather conditions caused loss power, telecommunications, utilities and transport.

Analysis of the winter season 2020-2021 for Ukraine compared to the 1981-2010 base period

Temperature

The average winter temperature 2020-21 was ranged from -5.2°C in the northeast to 3.8°C in Transcarpathia and south of Ukraine, and on highlands of the Carpathian and Crimea mountains was –0.2 … –3.6°C.

Deviations of the mean air winter temperature from average values of the 1981-2010 base period were +0.1 …+2.9°C (Figure.1).

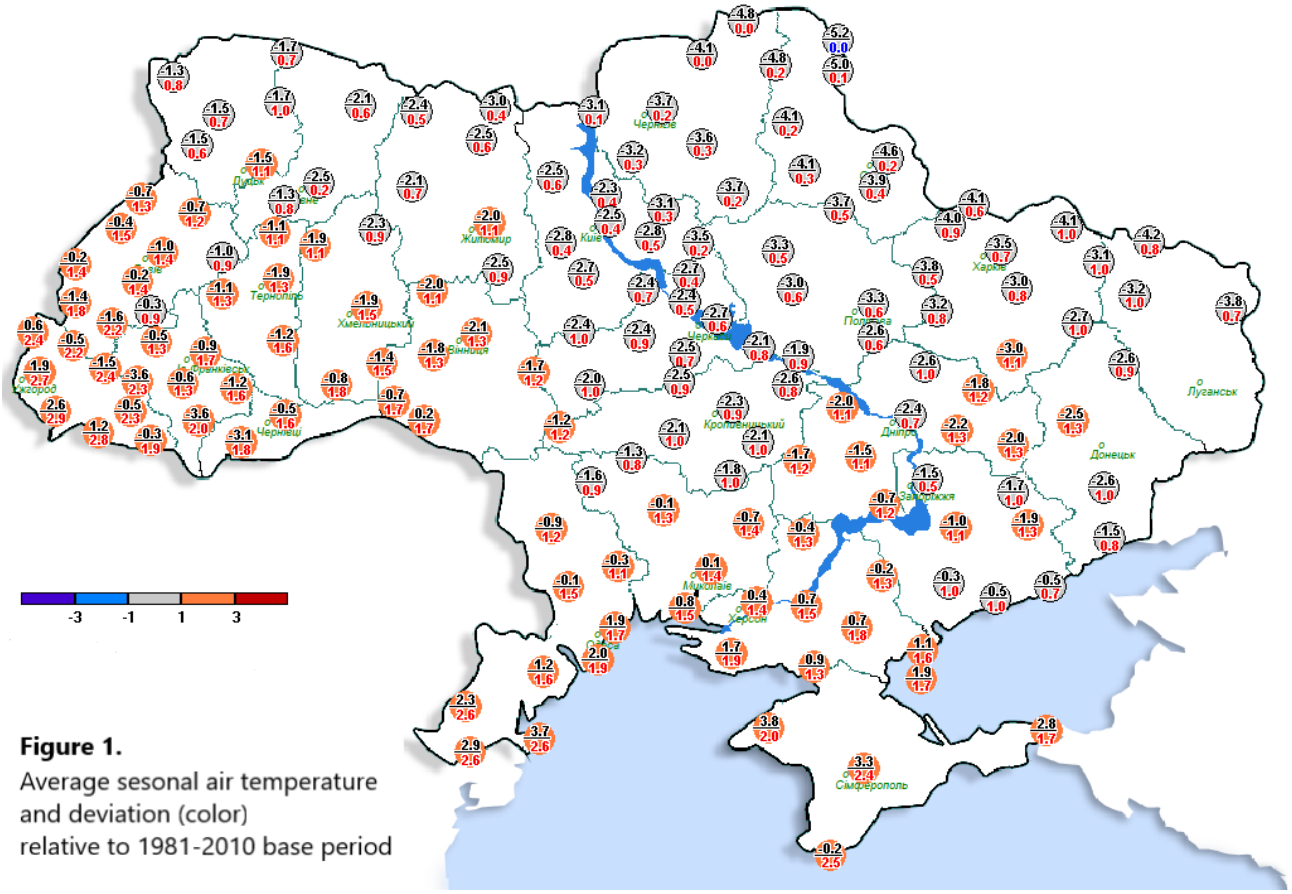


Figure 1.
Average sesonal air temperature and deviation (color) relative to 1981-2010 base period

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

From month to month deviation of the average temperature was positive and normal in December and January, ranged from +1°C to +4.5°C and in February was normal and negative, ranged from – 1°C to – 3°C relative to the average values of the 1981-2010 base period.

The minimum temperature ranged from –31.5°C in Luhansk region (east of the country) to –10.8°C in Zakarpattia region (west) and –10.9°C in Crimea (south). In the Carpathian mountains minimum temperature was –24°C. (Figure 2)

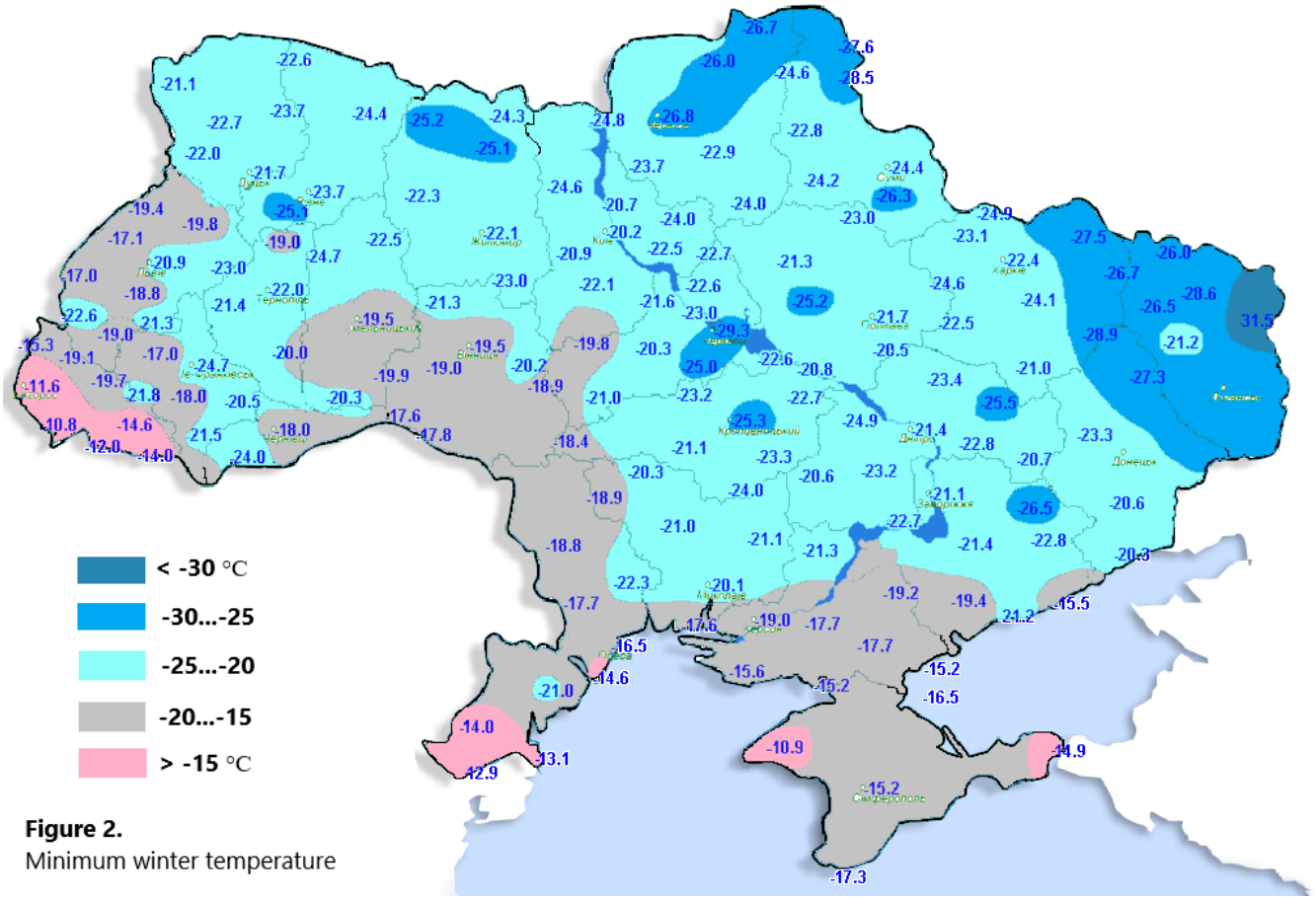


Figure 2.
Minimum winter temperature

The lowest air temperature during winter 2020-21, measuring –31.5°C was observed on 21th of Jenuary in Bilovodsk, also measuring –24,0°C was fixed on 19th of Jenuary in Selyatyn in Carpathian mountains.

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

Maximum temperature was in the range from 8.0°C in Symy region (northeast) to 19.9°C in Odessa region (southwest) and 19.0°C in Crimea. In Carpathian mountains (highlands) 6,7…9,2°C (Figure 3).

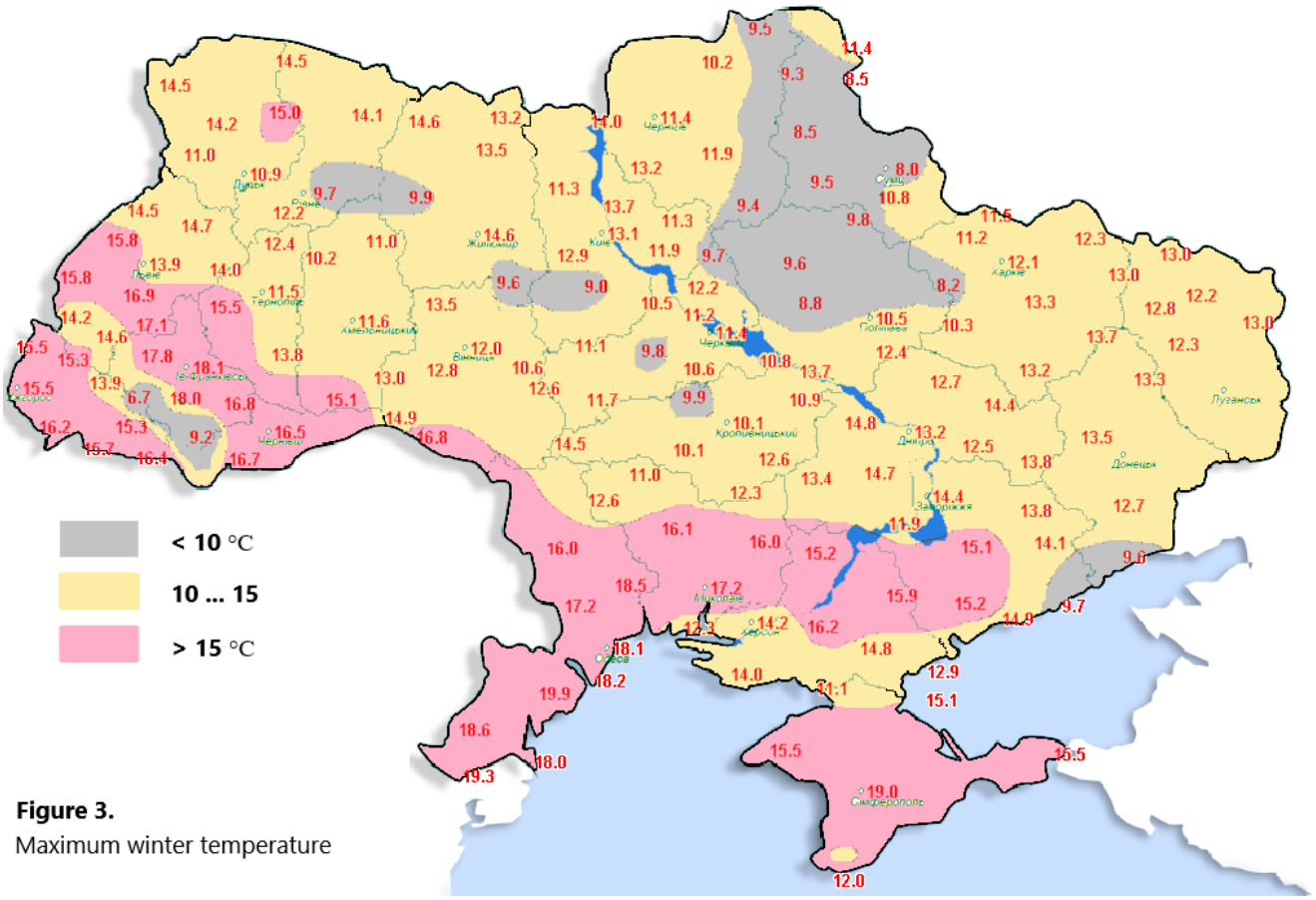


Figure 3.
Maximum winter temperature

The highest daily air temperature during the winter 2020-21, measuring 19,9°C was observed on 26th of February and 19.0°C on 1 of February in Simferopol.

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

Precipitation

In the winter 2020-21 were dominanted wet conditions (120…232%), in east and southeast, some places in west were normal conditions (80..120%), but in the southeastern part were separate stations with some dry conditions (70…79%) compared to the average values of the 1981-2010 base period (Figure.4).

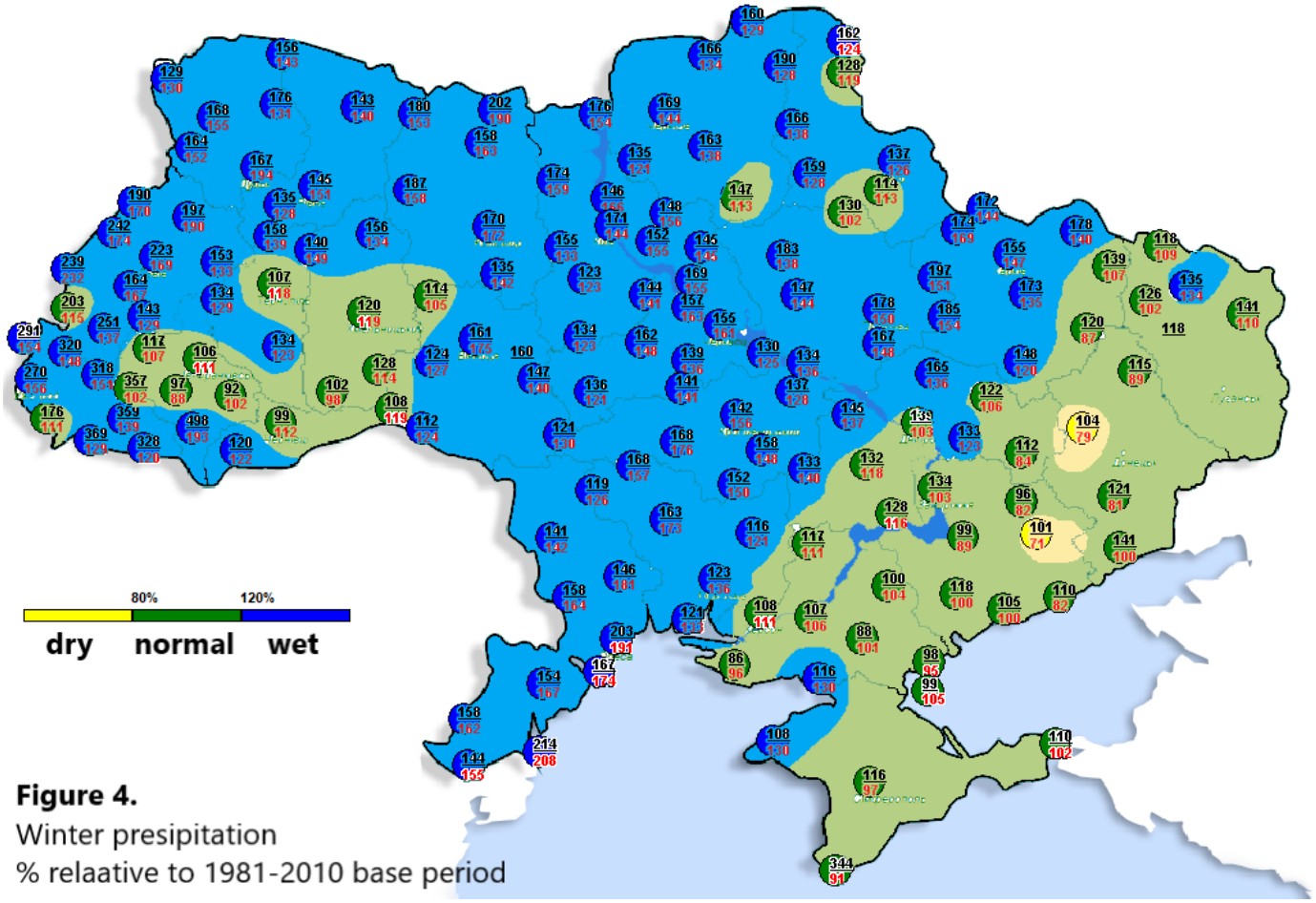


Figure 4.
Winter presipitation
% relaative to 1981-2010 base period

Seasonal precipitation was ranged from 92 mm (102% of the norm) in Ivano-Frankivsk region (Kolomyia) to 498 mm (193%) in the hightland of Carpathian (Pozhezhevska) (Figure 4).

The biggest daily presipitation was recorded in Vylkove (south of Odesa region) – 60 mm on 27th of January and longest period with snowfall for 10 days (03…12/02/2021) was recorded in Pozhezhevska (hightland of Carpathian).

From month to month in the winter precipitation was not homogeneous.
In December were predominated normal conditions (85…120%), in southeast and some places in west were dry condition (34…80%).
In January and February were predominated wet conditions with month sum of presipitation 100…382% , only in February in the southeastern part of the country were dry conditions 42…78% relative to average values of 1981-2010 based period.

Winter 2020-21 was snowy in Ukraine, especialy in February.
Maximum snow depth 30…57 cm was recorded in western and northern parts and in separate places of Chercasy, Mykolaiv and Odesa regions. In Carpathian and Crimea mountains (highlands) was recorded snow depth 34…88 cm (Figure 5.).

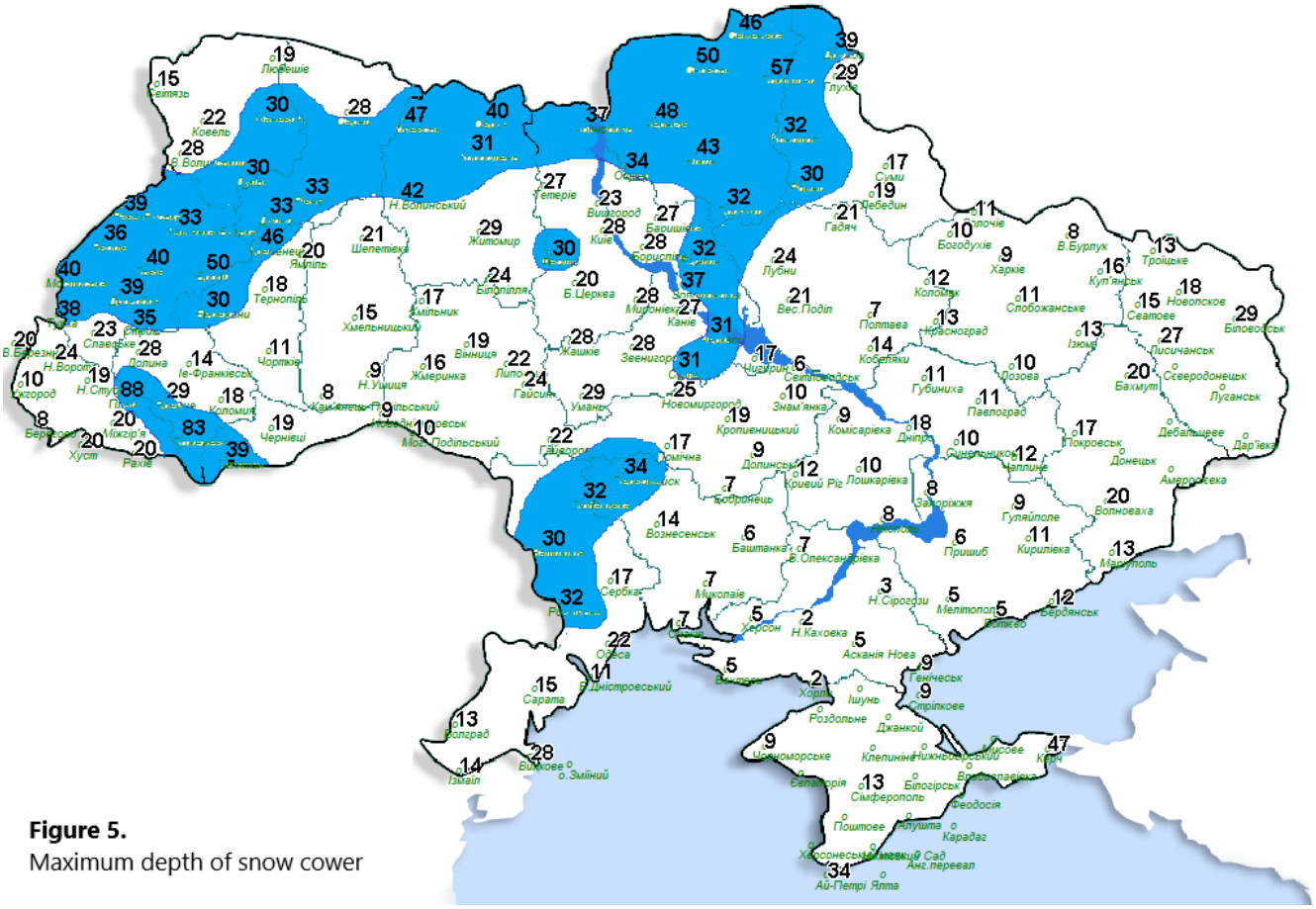


Figure 5.
Maximum depth of snow cower

During the winter, snow cover occurred for long periods.
The number of days with snow cover during the winter 2020-21 was different acros the country. Most days with snow cover were from 30 to 60, in the northeastern part were 60…80 days with maximum 84 days in Hlyhiv (Symu region), but in the southern part were 10…30 days with snow cower.

Analysis of the winter season 2020-21 for Ukraine compared to the 1991-2020 base period

Temperature

Deviations of the mean air temperature were -0,7…0,9°C from the climate norm, only in Transcarpathia and Carpathians, in some places southwestern and southern parts of Ukraine were deviation 1,1…2.3 °C above the norm (Figure 1).

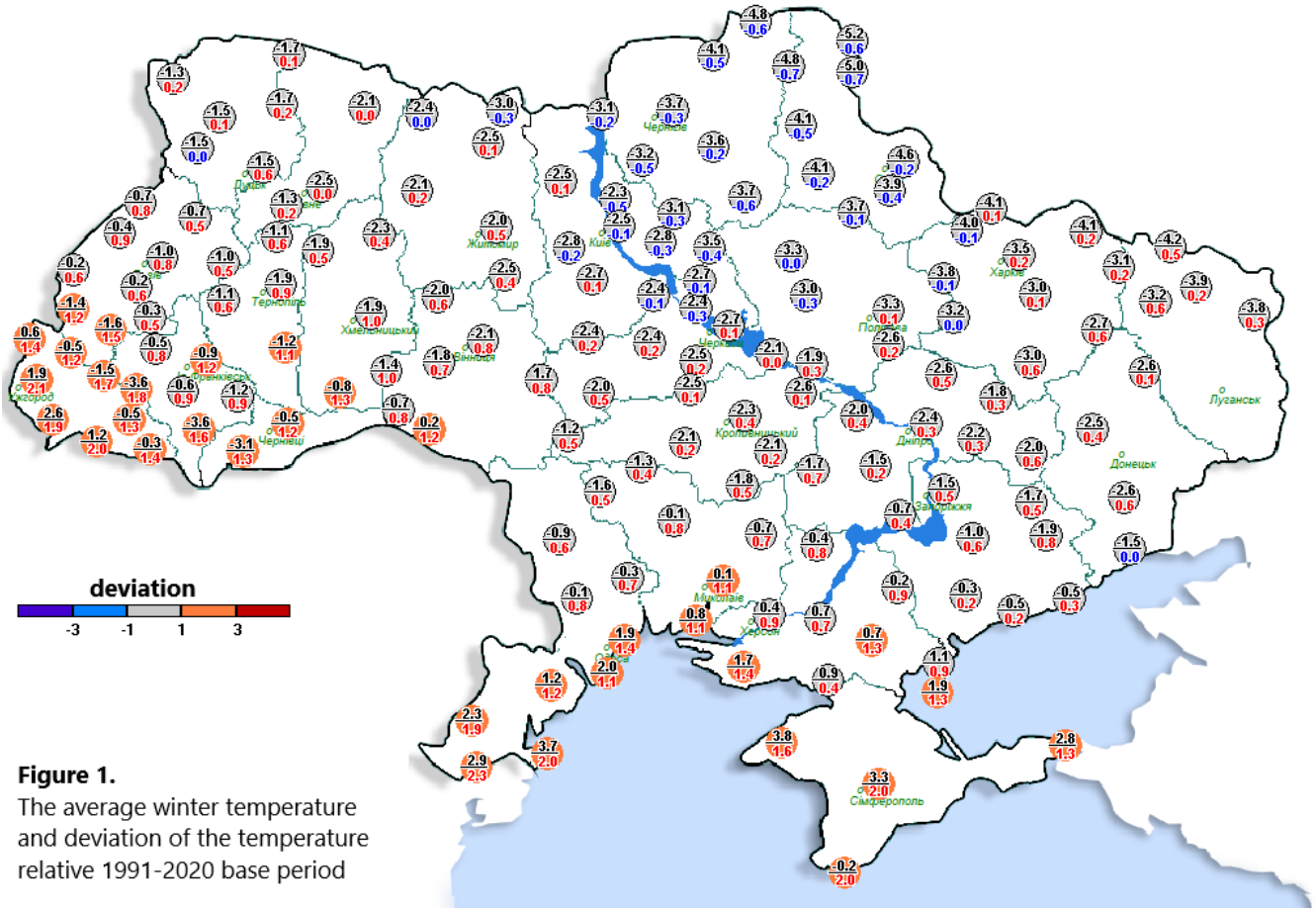


Figure 1.
The average winter temperature and deviation of the temperature relative 1991-2020 base period

According to the tercile method (with 1991–2020 climatological norm), mean air temperature in the winter 2020-21 was in the normal category at most station, but in southern and southwestern parts of the country were warm conditions.

Precipitation

Most stations recorded wet and normal conditions of moisture (80…177%) and in the southeastern part were some places with dry conditions (73….79%) compared to the 1991-2020 climate norm (Figure 2).

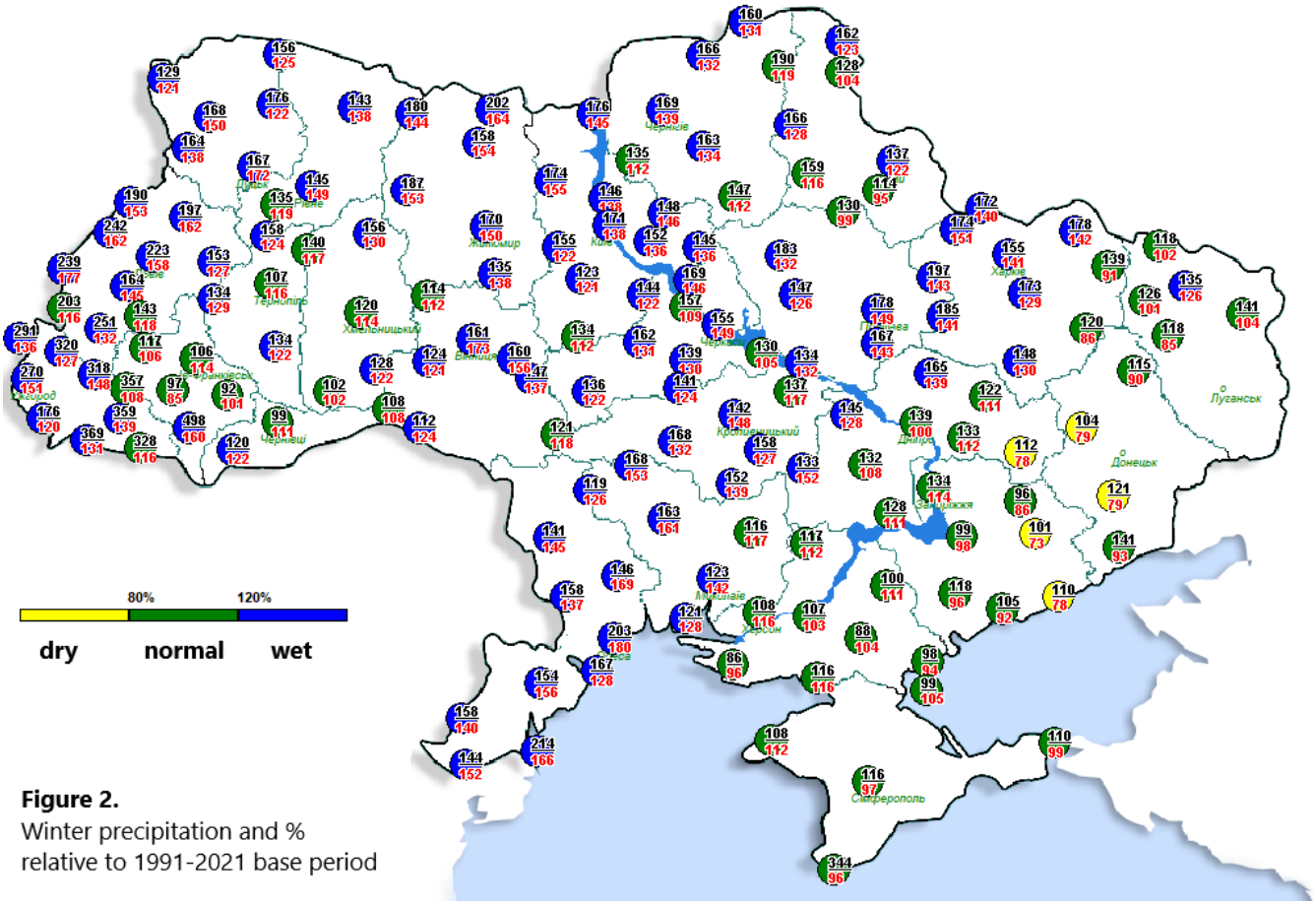


Figure 2.
Winter precipitation and % relative to 1991-2021 base period

According to the tercile method (with 1991–2020 climatological norm), winter 2020-21 presipitation were in the wet and normal category at most station, but dry conditions were in some places of eastern part of Ukraine.