



**VERIFICATION OF THE SEECOF-26
WINTER 2021 – 2022 CLIMATE OUTLOOK
AND
SEASONAL BULLETIN
FOR THE TERRITORY OF UKRAINE**

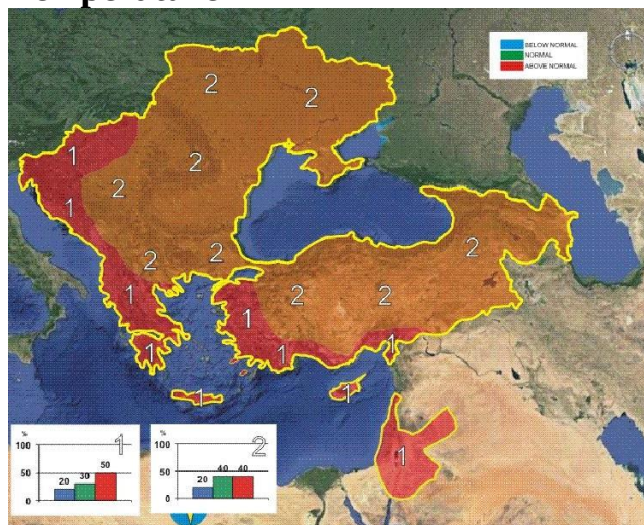
Kyiv, 8 April 2022

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VERIFICATION OF THE SEECOF-26 WINTER 2021-22 CLIMATE OUTLOOK FOR THE TERRITORY OF UKRAINE (1981–2010 BASE PERIOD)

Temperature



According to the SEECOF-26 outlook for the the winter 2021-22 in Ukraine, seasonal temperature was expected warmer (upper tercile) and normal with equal probability 40% and below (low tercile) with probability (20%) compared to the 1981–2010 climatological base period.

Climatological monitoring showed that the winter 2021-22 was warm in most of the territory of Ukraine, only in some plases of Carpathian mountains were fixxed normal conditions based on the tercile method (Figure 1.).

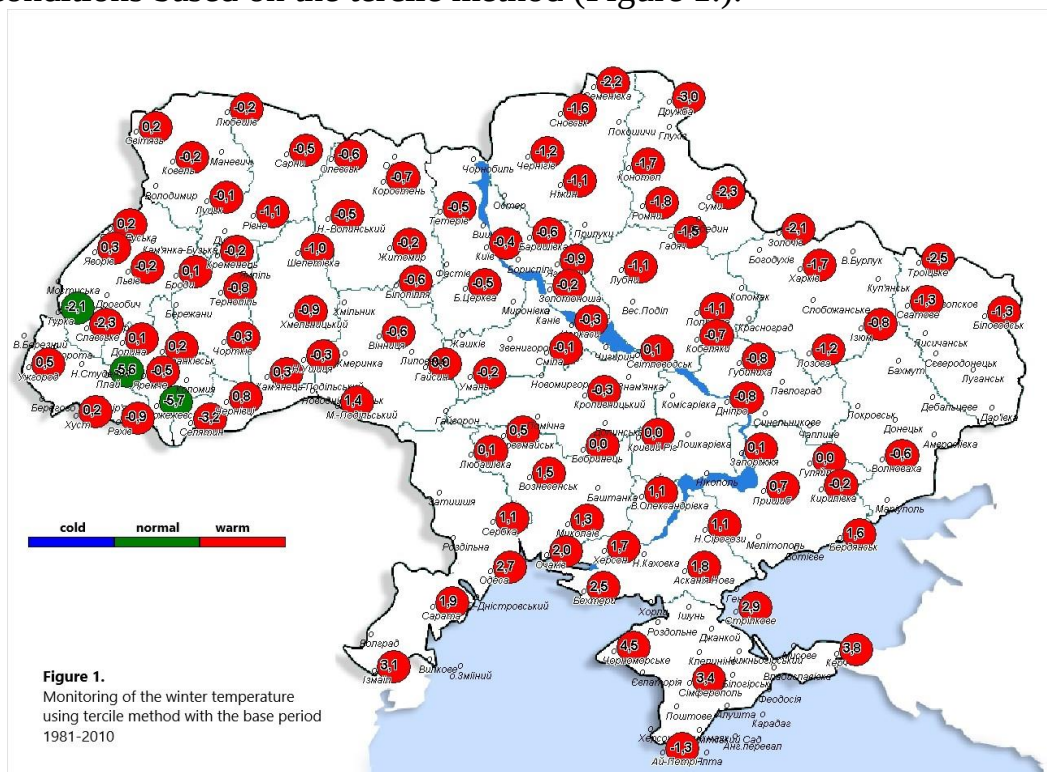


Figure 1.
Monitoring of the winter temperature
using tercile method with the base period
1981-2010

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

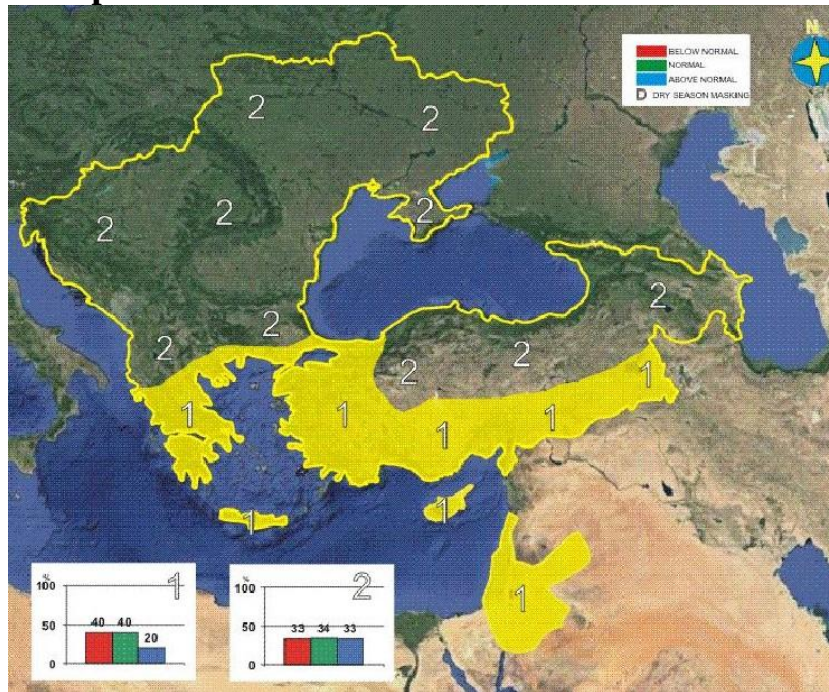
Winter 2021-22			Air Temperature (°C)				
synop		Station	Rank	33	50	66	Observed
1	33526	Ivano-Frankivsk	10	-2,6	-1,9	-1,2	0,2
2	33889	Izmail	3	-0,3	0,7	1,4	3,1
3	34415	Izym	6	-3,7	-3,0	-2,2	-0,8
4	33998	Ai-Petri	12	-2,7	-2,1	-1,5	-1,3
5	99915	Askaniya Nova	4	-1,4	-0,4	0,3	1,8
6	33464	Bila Cerkva	6	-3,5	-2,5	-2,0	-0,5
7	34434	Bilovodsk	5	-4,8	-4,1	-3,2	-1,3
8	33446	Bilopillya	5	-3,5	-2,8	-2,0	-0,6
9	33354	Baryshyvka	4	-3,3	-2,5	-2,2	-0,6
10	34717	Berdiyansk	5	-1,5	-1,0	0,1	1,6
11	33907	Behtery	4	-0,3	0,5	1,2	2,5
12	33717	Bobrynec	5	-2,9	-1,9	-1,6	0,0
13	33297	Brody	10	-2,2	-1,5	-0,4	0,1
14	33862	V.Oleksandrivka.	4	-2,1	-0,8	-0,4	1,1
15	33562	Vinnyca	6	-3,6	-3,0	-2,0	-0,6
16	33777	Voznesensk	5	-1,5	-0,7	-0,1	1,5
17	34615	Volnovaha	4	-4,0	-3,1	-2,1	-0,6
18	33376	Hadyach	5	-3,8	-3,4	-3,0	-1,5
19	33577	Haisyn	4	-3,0	-2,2	-1,6	0,0
20	34407	Hybinyha	5	-3,8	-2,8	-2,2	-0,8
21	34606	Hyliai Pole	6	-2,9	-2,1	-1,2	0,0
22	34504	Dnipro	9	-3,4	-2,6	-2,0	-0,8
23	33524	Dolyna	13	-2,1	-1,3	-0,3	0,1
24	33058	Dryzhba	8	-4,8	-4,4	-4,0	-3,0
25	33325	Zhitomyr	6	-3,2	-2,3	-1,6	-0,2
26	34601	Zaporizzhya	8	-2,4	-1,8	-1,3	0,1
27	33484	Zolotonosha	4	-3,0	-2,4	-1,9	-0,2
28	34208	Zolochiv	6	-4,5	-3,9	-3,3	-2,1
29	33548	Kamyanec-Podilskiy	6	-2,8	-2,0	-0,8	0,3
30	33983	Kerch	4	0,6	1,7	2,6	3,8
31	33345	Kyiv	6	-3,0	-2,1	-1,8	-0,4
32	34609	Kyrylivka	4	-3,6	-2,7	-1,8	-0,2

33	33621	Kobelyaky	5	-3,0	-2,6	-2,3	-0,7
34	33173	Kovel	12	-2,2	-1,2	-0,6	-0,2
35	33261	Konotop	6	-3,8	-3,5	-3,0	-1,7
36	33215	Korosten	7	-3,0	-2,2	-1,6	-0,7
37	33299	Kremenec	12	-2,3	-1,3	-0,8	-0,2
38	33791	Kryviy Rih	5	-3,1	-2,2	-1,7	0,0
39	33711	Kropyvnutsky	5	-3,3	-2,4	-2,0	-0,3
40	34409	Lozova	5	-4,1	-3,4	-2,8	-1,2
41	33377	Lubnu	4	-3,5	-3,0	-2,8	-1,1
42	33187	Luck	9	-2,7	-1,8	-0,9	-0,1
43	33393	Lviv	10	-2,7	-1,6	-0,7	-0,2
44	33761	Liybashivka	4	-2,6	-2,2	-1,1	0,1
45	33075	Lybeshiv	9	-2,3	-1,4	-0,7	-0,2
46	33846	Mykolaiv	4	-1,7	-0,5	-0,2	1,3
47	33663	Mohyliv-Podilskiy	5	-1,7	-1,2	0,1	1,4
48	33312	Novohrad Volynskiy	7	-2,8	-2,0	-1,3	-0,5
49	33877	Nyzhni Sirohozy	4	-1,8	-0,8	-0,4	1,1
50	33557	Nova Ushica	6	-3,3	-2,5	-1,4	-0,3
51	33246	Nizhin	5	-3,8	-3,0	-2,7	-1,1
52	33837	Odesa	3	-0,2	0,8	1,1	2,7
53	33203	Olevsk	7	-3,0	-2,0	-1,4	-0,6
54	33848	Ochakiv	4	-1,1	0,1	0,4	2,0
55	33699	Pervomaisk	4	-2,4	-1,5	-0,7	0,5
56	33515	*Play	26	-6,5	-5,7	-5,2	-5,6
57	33646	Pozhezhevska	32	-6,0	-5,6	-5,1	-5,7
58	33506	Poltava	5	-3,6	-3,1	-2,9	-1,1
59	33301	Rivne	14	-2,8	-2,2	-1,7	-1,1
60	33287	Rava-Ryska	10	-2,3	-1,2	-0,3	0,2
61	33647	Rahiv	16	-2,7	-2,0	-1,1	-0,9
62	33268	Romny	5	-4,0	-3,6	-3,3	-1,8
63	33946	Simferopol	4	0,5	1,6	2,2	3,4
64	33896	Sarata	4	-0,8	0,1	0,7	1,9
65	33088	Sarny	9	-2,7	-1,9	-1,2	-0,5
66	33614	Svitlovodsk	4	-2,5	-1,9	-1,6	0,1

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

Rank – 1961-2022 (warmest season), *Play – rank 1981-2022

Precipitation



The SEECOF-26 climate outlook indicated equal probabilities for below (33%), normal (34%) and above normal (33%) conditions for the territory of Ukraine.

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

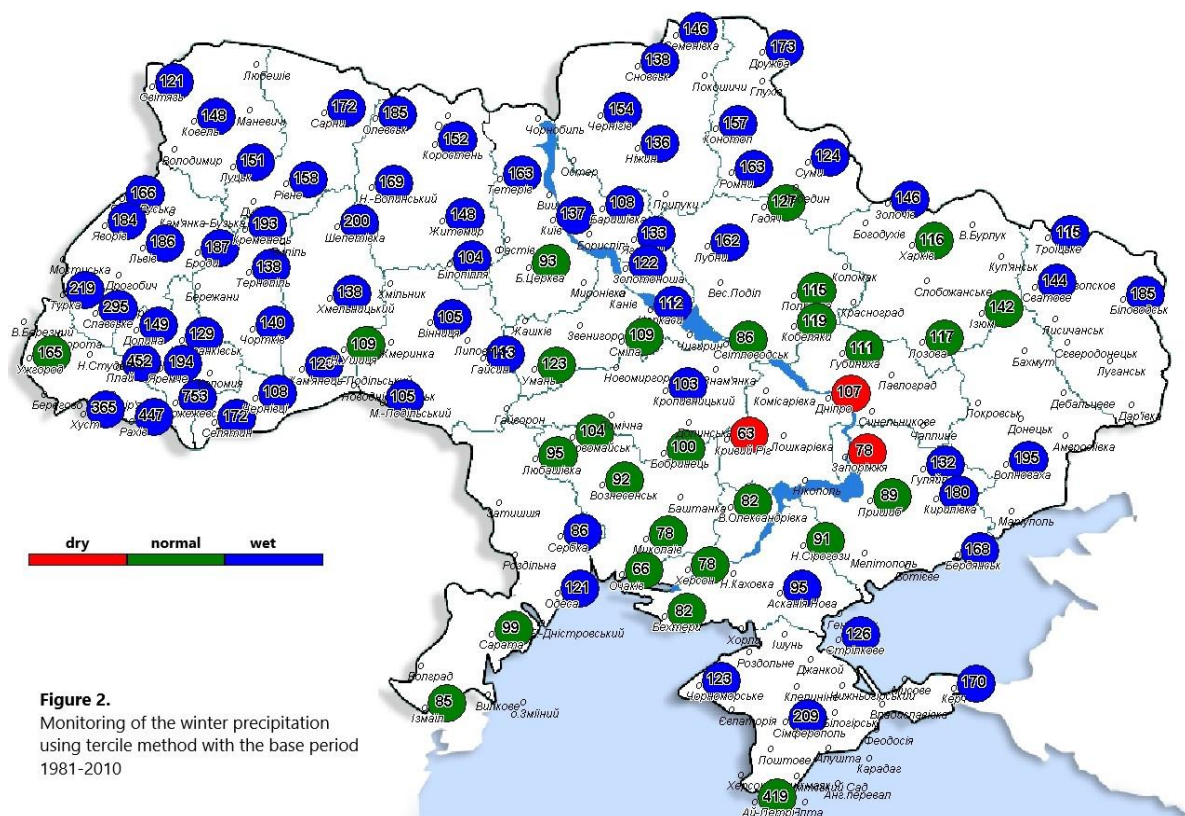


Figure 2.
Monitoring of the winter precipitation
using tercile method with the base period
1981–2010

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	12	83	91	104	129
2	33889	Izmail	36	73	84	97	85
3	34415	Izymb	28	123	137	150	142
4	33998	Ai-Petri	27	317	358	427	419
5	99915	Askaniya Nova	24	59	84	88	95
6	33464	Bila Cerkva	36	87	95	114	93
7	34434	Bilovodsk	10	104	115	139	185
8	33446	Bilopil'ya	25	80	99	103	104
9	33354	Baryshyvka	21	79	94	105	108
10	34717	Berdiyansk	16	108	116	135	168
11	33907	Behtery	38	75	84	96	82
12	33717	Bobrynec	34	77	95	115	100
13	33297	Brody	5	100	113	123	187
14	33862	V.Oleksandrivka.	41	72	89	125	82
15	33562	Vinnyc'a	27	77	88	103	105
16	33777	Voznesensk	34	64	91	109	92
17	34615	Volnovaha	12	121	139	153	195
18	33376	Hadyach	34	110	128	133	127
19	33577	Haisyn	27	88	97	107	113
20	34407	Hybinyha	39	105	118	126	111
21	34606	Hyl'iai Pole	17	89	116	125	132
22	34504	Dnipro	44	112	120	139	107
23	33524	Dolyna	13	90	102	118	149
24	33058	Dryzhba	10	112	121	148	173
25	33325	Zhitomyr	8	81	103	107	148
26	34601	Zaporizzhya	55	103	115	139	78
27	33484	Zolotonosha	27	94	104	117	122
28	34208	Zolochiv	16	101	116	133	146
29	33548	Kamyanec-Podil'skiy	22	83	97	115	123
30	33983	Kerch	6	86	105	120	170
31	33345	Kyiv	20	110	119	127	137

32	34609	Kyrylivka	13	121	136	149	180
33	33621	Kobelyaky	34	88	113	127	119
34	33173	Kovel	6	92	103	120	148
35	33261	Konotop	15	100	115	125	157
36	33215	Korosten	7	85	99	102	152
37	33299	Kremenec	5	101	111	122	193
38	33791	Kryviy Rih	51	68	83	93	63
39	33711	Kropyvnutsky	24	76	82	101	103
40	34409	Lozova	37	108	118	130	117
41	33377	Lubnu	19	115	129	141	162
42	33187	Luck	5	70	83	95	151
43	33393	Lviv	8	113	120	145	186
44	33761	Liybashivka	34	74	87	107	95
45	33075	Lybeshiv	10	105	116	122	132
46	33846	Mykolaiv	40	68	88	109	78
47	33663	Mohyliv-Podilskiy	26	69	85	99	105
48	33312	Novohrad Volynskiy	9	106	119	131	169
49	33877	Nyzhni Sirohozy	35	76	87	107	91
50	33557	Nova Ushica	31	88	100	116	109
51	33246	Nizhin	21	105	118	127	136
52	33837	Odesa	29	81	102	120	121
53	33203	Olevsk	5	102	115	126	185
54	33848	Ochakiv	46	65	85	97	66
55	33699	Pervomaisk	37	81	106	113	104
56	33515	*Play	12	265	299	358	452
57	33646	Pozhezhevskaya	1	208	227	251	753
58	33506	Poltava	35	93	118	126	115
59	33301	Rivne	3	73	80	92	158
60	33287	Rava-Ryska	6	95	112	120	166
61	33647	Rahiv	5	229	245	321	447
62	33268	Romny	14	90	122	135	163
63	33946	Simferopol	2	99	125	140	209
64	33896	Sarata	28	66	85	101	99
65	33088	Sarny	2	86	96	108	172

66	33614	Svitlovodsk	38	78	93	102	86
67	33067	Svityaz	16	89	96	108	121
68	34421	Svatove	21	100	119	133	144
69	33657	Selyatyn	1	78	90	102	172
70	33049	Semenivka	14	100	125	131	146
71	33833	Serbka	29	61	79	84	86
72	33516	Slavske	3	149	163	177	295
73	33593	Smila	31	83	105	113	109
74	33961	Strilcove	10	79	90	99	126
75	33275	Symy	25	85	106	116	124
76	33415	Ternopil	8	77	89	96	138
77	33228	Teteriv	7	97	109	118	163
78	33511	Tyrka	8	153	165	179	219
79	33631	Uzhhorod	37	159	187	203	165
80	33587	Uman	30	92	108	123	123
81	34300	Kharkiv	28	90	96	116	116
82	33902	Kherson	40	76	88	104	78
83	33429	Khmelnitskiy	12	86	102	112	138
84	33638	Khyst	13	259	277	325	365
85	33487	Chercasy	22	79	95	101	112
86	33658	Chernivci	21	69	86	91	108
87	33135	Chernihiv	12	97	120	128	154
88	33924	Chornomorske	14	68	76	93	123
89	33536	Chortkiv	12	90	102	117	140
90	33317	Shepetivka	3	107	111	125	200
91	33136	Snovsk	22	102	126	135	138
92	33392	Yavoriv	9	117	136	157	184
93	33356	Yahotyn	14	75	96	108	133
94	33645	Yaremche	2	93	109	110	194

Rank – 1961-2022 (Wettest season), *Play – rank 1981-2022

Assessment of the SEECOF-26 Climate outlook for winter 2021-22

Country	Seasonal Temperature (DJF)		Seasonal Precipitation (DJF)		High impact Events
	Observed	SEECOF-26 climate outlook	Observed	SEECOF-26 climate outlook	
Ukraine	above 97% normal 3%	above and normal (40%) below normal (20%)	above normal (77%) normal (30%) below normal (3%)	above (33%) normal (34%) below (33%)	Meteorological extraordinary phenomena were observed In December 02-03th - heavy rain and snowfall (20-38 mm precipitation per 12 hours) in Zakarpattia and Ivano-Frankivsk regions and 28th in Kharkiv region, 28-30th - heavy ice (diameter 26-35 mm) in Donetsk, Mykolaiv, Kherson regions. In January were recorded 04-05th heavy snowfalls (20-33 mm/12 hours) in Ivano-Frankivsk region and in Zakarpattia region were fixed 102 mm/43 hours In February were recorded 17, 19th - strong wind 25-27 m/c in Ivano-Frankivsk and Lviv regions. Unfavorable weather conditions caused loss power, telecommunications, utilities and transport.

Analysis of the winter season 2021-2022 for Ukraine compared to the 1981-2010 base period

Temperature

The average winter temperature 2021-22 was ranged from -3.0°C in the northeast to 4.5°C in south of Ukraine, and on highlands of the Carpathian and Crimea mountains was $-1.3 \dots -5.7^{\circ}\text{C}$.

Deviations of the mean air winter temperature from average values of the 1981-2010 base period were $+0.3 \dots +3.2^{\circ}\text{C}$ (Figure.1).



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

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

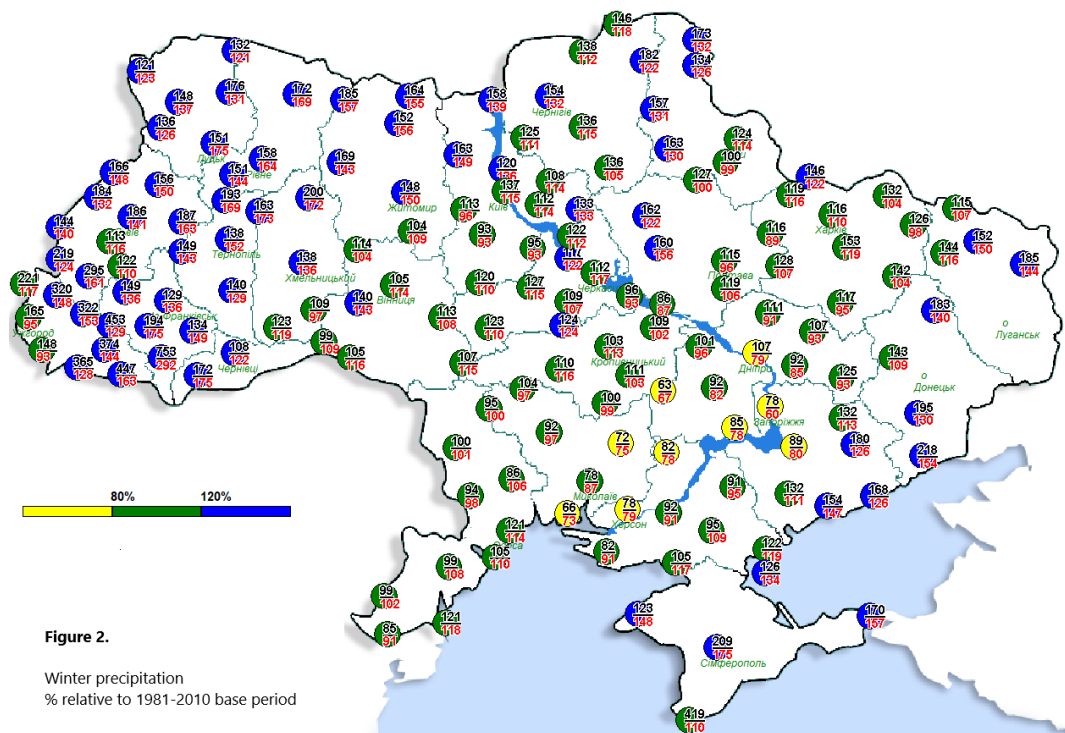
The minimum temperature ranged from $-7..12^{\circ}\text{C}$ in Crimea and Odesa region (southwest and south of the country) to $-23.. -25^{\circ}\text{C}$ in Sumy and Luhansk regions (northeast, east). In the Carpathian mountains minimum temperature was $-21... -26^{\circ}\text{C}$. The lowest air temperature during winter 2021-22, measuring -26.4°C was observed on 25th of January in Seliatyn (Carpathian mountains).

Maximum temperature was in the range from 7°C in Sumy region (northeast) to 17°C in Odessa region (southwest) and to 21°C in Crimea (south). In Carpathian mountains (highlands) $4...7^{\circ}\text{C}$.

The highest daily air temperature during the winter 2021-22, measuring 19.9°C was observed on 07th of December in Simferopol.

Precipitation

In the winter 2021-22 were dominated wet and normal conditions (81...292%), in south and southeast were separate regions with dry conditions (60...80%) compared to the average values of the 1981-2010 base period (Figure.2).



Seasonal precipitation was ranged from 63 mm (67% of the norm) in Kryvy Rih (Dnipro region) to 218 mm in Mariupol (Donetsk region) and 753 mm (292%) in the highland of Carpathian (Pozhezhevskia) (Figure 2).

The biggest daily precipitation 50 mm on 5th of January and longest period with snowfall for 15 days (20/01...03/02) was recorded in Pozhezhevskia (highland of Carpathian).

Winter 2021-22 was snowy in Ukraine.

Maximum snow depth was recorded from 5-15 cm in southern part to 20-35 cm in northeastern part of Ukraine. In Carpathian and Crimea mountains (highlands) was recorded snow depth 41...93 cm.