National Climatic Data Center

DATA DOCUMENTATION

FOR

DATA SET 9806A (DSI-9806A)

Daily Temperature and Precipitation Data
for 223 USSR Stations

January 2, 2003

National Climatic Data Center
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1. Abstract: This data set contains daily temperature and precipitation measurements collected at 223 USSR stations over the period 1881-1993. It was originally compiled from digital and manuscript records archived at the Research Institute of Hydrometeorological Information (RIHMI) in Obninsk, Russia. These data were acquired as a result of a bilateral initiative known as the Agreement on Protection of the Environment established on May 23, 1972 between the United States and the Union of Soviet Socialist Republics (USSR). The primary goal of the initiative, which remains active despite the breakup of the USSR, is to promote cooperation between the two countries (Russia and the United States) on numerous environmental protection issues. Currently, the agreement fosters joint research in at least 11 "Working Groups" (i.e., areas of study) one of which is Working Group VIII.

Given recent interest in possible greenhouse gas-induced climate change, Working Group VIII has become particularly useful to the scientific communities of both nations. Among its achievements is to promote the transfer of climatological information between the principal climate data centers in each country [i.e., the National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC) in Asheville, North Carolina, and the RIHMI in Russia]. A considerable amount of data has been exchanged as a result of this project. This data set of daily temperature and precipitation was acquired in 1990 with periodic updates continuing in the 1990s. In 1993, the Carbon Dioxide Information Analysis Center performed an extensive examination of these data and produced a Numeric Data Package for these data from which this documentation was largely derived.

Daily mean, minimum, and maximum temperatures are available (to the nearest tenth of a degree Celsius) for each station. Temperature observations were taken eight times a day from 1966-93, four times a day from 1936-65, and three times a day from 1881-1935. Daily mean temperature is defined as the average of all observations for each calendar day. Daily maximum/minimum temperatures are derived from maximum/minimum thermometer measurements. To identify potentially erroneous data, two flag codes accompany each daily value.

Daily precipitation totals are also available (to the nearest tenth of a millimeter) for each station. Throughout the record, daily precipitation is defined as the total amount of precipitation recorded during a 24-hour period, snowfall being converted to a liquid total by melting the snow in the gauge. From 1936 on, rain gauges were checked several times each day; the cumulative total of all observations during a calendar day was presumably used as the daily total. Wetting corrections <=0.2 mm were applied beginning in 1966, depending upon the type and amount of precipitation. As with temperature, two data quality flags accompany each daily total.

The size of the observing network has increased with time. Twenty-three sites contain daily measurements dating to 1881 (though for 76 stations, maximum and/or minimum temperature observations began several years after mean temperature and precipitation). Aside from the period 1914-21 (i.e., during World War I, the Russian Revolution, and the Civil War), the number of stations rose at a relatively constant rate over the next half-century. The largest change in the network occurred in 1936, when an additional 65 observing posts were opened. Thereafter, only modest additions are evident, all stations collecting data by 1966 and only five (Adamovka, Vereb'e, Oktiabr'skaya, Rostov-na-Donu, and Surgut) closing before 1989. As the number of operational stations increased, spatial coverage improved. The

distribution of posts early in the record, for example, is biased. In fact, most stations were located in population centers west of the Ural Mountains and at ports along the Black and Caspian seas, whereas vast tracts of Siberia were entirely unsampled. Spatial coverage was much more representative of the country for the mid-1930s, with the exception of certain areas east of the Urals and north of the Arctic Circle. From a practical standpoint, the data set can probably be used to study long-term climate variations over the entire USSR for the period 1936-93. The density of stations, as well as their spatial distribution, was even better by 1985. Except for areas along the coast of the Arctic Ocean, most of the country was extremely well-sampled. In general, however, Arctic regions in the eastern part of the country are somewhat underrepresented throughout the record. The amount of missing data varies from element to element and station to station. Typically, the records of minimum/mean temperature are more complete than those of maximum temperature and rainfall. Most stations (90%) have at least 50 years of data for each parameter.

Recording methods and instrumentation varied considerably over the period of record. The following describes the types of instruments used throughout the network, the apparatus employed to shelter these instruments, and the times at which observations were taken. Temperature and precipitation are addressed separately. Additional information regarding the history of the network is contained in publications and instruction manuals prepared by the Academy of Sciences of the Russian Empire (1892, 1893, 1894, 1896, 1897, 1898, 1900, 1902, 1908, 1912), The Nicholas Main Physical Observatory (1915), The Voyeikov Main Geophysical Observatory (1928, 1931, 1963), the Central Administration of the Unified Hydrometeorological Service of the USSR (1935, 1936, 1939, 1940), the Council of Ministers of the USSR (1946, 1954, 1958, 1962, 1969, 1985), and Gidrometeoizdat (1972).

Temperature

The types of thermometers in use at each station remained the same throughout the period of record. Minimum temperature was consistently measured with an alcohol thermometer, whereas hourly and maximum temperatures were each collected with separate mercury thermometers. When the air temperature approached the freezing point of mercury (-38.9 C), either an alcohol thermometer, or in some cases a minimum thermometer alcohol column, was used in place of the mercury thermometer. Whether or not (much less when) the thermometers themselves were replaced at each station is not currently known.

The type of shelter or screen surrounding the thermometers varied considerably before 1930. In 1912, official instructions recommended sheltering thermometers with the Stevenson-type screen (before 1912, no such guidelines existed). However, it is likely that this change was not implemented at many stations. From 1920-30, Stevenson screens were replaced with the current screens (name unknown) at all operating stations. In 1928, additional guidelines regarding the exact dimensions of the shelters and their mounting heights were issued (before 1928, no such specifications had been defined). Therefore, from 1930 on, most stations had their thermometers sheltered in roughly the same fashion.

Major changes in the time of observation occurred in 1936 and 1966. Prior to 1936, "hourly" measurements for computing daily mean temperature were taken at 0700, 1300, and 2100 Local Mean Time (LMT) (minimum and maximum thermometers were checked at one of these hours or at 0900 LMT, depending upon the year). Because of the lack of nighttime observations, daily mean temperature was

probably overestimated by some location-dependent amount during this period. Beginning in 1936, all thermometers (hourly, minimum, and maximum) were checked at 0100, 0700, 1300, and 1900 LMT at most stations. As a result, the bias in daily mean temperature dropped to ~0.2 C. From 1966 present, all thermometers were checked at 3-h intervals beginning at midnight Moscow winter Legal Time (MLT) (MLT being three hours later than Greenwich Mean Time). This rendered the bias in daily mean temperature insignificant.

Temperature recording methods and instrumentation

Year	Recording method/instrumentation implemented
1881	Measurements for computing daily mean temperature taken at 0700, 1300, and 2100 LMT; mercury thermometer used; because of alack of nighttime observations, daily mean temperature were probably overstated.
1881	Daily minimum temperature thermometer checked at 0900 LMT; alcohol thermometer used.
1881	Daily maximum temperature thermometer checked at 0900 LMT; mercury thermometer used.
1881	No regulations regarding type of shelter surrounding thermometers.
1883	Daily minimum temperature thermometer checked at 0700 and 2100 LMT (lower value chosen); multiple measurements taken only to determine approximate time of occurrence of minimum.
1891	Daily maximum temperature thermometer checked at 1300 and 2100 LMT (higher value chosen); multiple measurements taken only to determine approximate time of occurrence of maximum.
1912	Official meteorological instructions recommended use of Stevenson screen to shelter thermometers; practice not implemented at all stations.
1920	Official meteorological instructions recommended use of current screen to shelter thermometers; practice implemented over next ten years.
1928	Official meteorological instructions specified exact size/height of screens.
1936	Measurements for computing daily mean temperature taken at 0100, 0700, 1300, and 1900 LMT (or at 0700, 1300, 1900, and 2100 LMT); bias in daily mean temperature dropped to ~0.2 C; daily maximum and minimum thermometers may or may not have been checked each hour.
1966	Measurements for all temperature variables collected at 3-hour intervals beginning at midnight MLT; bias in daily mean temperature eliminated.

Precipitation

The type of rain gauge used at each station changed at least once during the period of record. In particular, the old-style gauge (type unknown) was replaced with the Tretyakov-type gauge over the period 1946-60. Whether or not other gauge replacements occurred at each station is not currently known.

The type of shielding surrounding the rain gauges varied considerably over

time. For example, in 1883, official instructions recommended that cross-shaped zinc strips be inserted into the gauge to prevent snow from drifting. Other shielding guidelines were issued at various times over the next half-century, up until the Tretyakov-type gauge was introduced. However, whether or not (much less when) any of the shields were installed at each station is not currently known.

Changes in the time of observation occurred in 1936, 1966, and 1986. Before 1936, rainfall was measured only at 0700 LMT. From 1936-65, gauges were checked at 0700 and 1900 LMT. Beginning in 1966, the time of observation became time-zone dependent (the USSR being comprised of 11 time zones). In particular, from 1966-85, readings were taken at 0300, 0900, 1500, and 2100 MLT in zone 2 (i.e., Moscow); at 0300, 0600, 1500, and 1800 MLT in zones 3-5; at 0300 and 1500 MLT in zones 6-8; at midnight, 0300, 1200, and 1500 MLT in zones 9-11; and at 2100, 0300, 0900, and 1500 MLT in zone 12 (the easternmost part of the USSR). In 1986, the 0300 and 1500 MLT observations were discontinued in all but the second time zone.

Precipitation recording methods and instrumentation

Year	Recording method/instrumentation implemented
1881	Rain gauge measurements taken at 0700 LMT; snowfall converted to a liquid total by melting snow in gauge; type of gauge and shielding not standardized.
1883	Official meteorological instructions recommended that cross-shaped zinc strips be inserted into the gauge to prevent snow from drifting; change probably not implemented at all stations.
1887	Official meteorological instructions recommended surrounding the gauge with the funnel-shaped Nifer's shield; change probably not implemented at all stations.
1892	Official meteorological instructions recommended erecting a fence around the gauge; change probably not implemented at all stations.
1902	Official meteorological instructions recommended erecting a double fence around the gauge; change probably not implemented at all stations.
1936	Rain gauge measurements taken at 0700 and 1900 LMT; daily total rainfall obtained by summing all measurements for the calendar day.
1946-60	Old-style gauge (exact type unknown) replaced with the Tretyakov-type gauge.
1966	Rain gauge measurements taken at 0300, 0900, 1500, and 2100 MLT in time zone 2; at 0300, 0600, 1500, and 1800 MLT in zones 3-5; at 0300 and 1500 MLT in zones 6-8; at midnight, 0300, 1200, and 1500 MLT in zones 9-11; and at 2100, 0300, 0900, and 1500 MLT in zone 12; wetting corrections <=0.2 mm applied to each hourly measurement (Because four observations per day were collected at stations in time zones 2-5 and 9-12, four corrections were counted in the daily total; therefore, total daily corrections are higher for stations in these areas.)
1986	Rain gauge measurements at 0300 and 1500 MLT discontinued at all stations except those in time zone 2.

2. Element Names and Definitions: The data are archived in a fixed length ASCII format. The total data volume is 345 megabytes. The data are sorted using the WMO station number as the primary key followed by Year, Month and Day.

Each record is of fixed length composed of 56 characters. The record format is:

Field ..	Width	Position
WMO Station Number	5	001-005
Year ..	4	007-010
Month ..	2	012-013
Day ..	2	015-016
Daily Temperature Group Flag	1	019
Daily Minimum Temperature	6	021-026
Daily Minimum Temperature Flag	1	028
Daily Mean Temperature	6	030-035
Daily Mean Temperature Flag	1	037
Daily Maximum Temperature	6	039-044
Daily Maximum Temperature Flag	1	046
Daily Precipitation	5	048-051
Daily Precipitation Quality Flag	1	053
Daily Precipitation Measurement Flag	1	055
	1	056 (not used)

EXAMPLE OF A RECORD
(As seen from a file dump)

20674b1936b12b16bb0bb-17.7b0bb-12.0b0bbb-4.3b0bbb21b0b0?
(The symbol 'b' denotes a blank)

DUMP POSITION	CONTENTS	MEANING
1-5	20674	WMO Station Number
6	b.	Blank
7-10	1936	Year
11	b.	Blank
12-13	12	Month
14	b.	Blank
15-16	16	Day
17-18	bb	Blank
19	0.	Daily Temperature Group Flag
20	b.	Blank
21-26	bb-17.7	Daily Minimum Temperature (-17.7 Deg C)
27	b.	Blank
28	0.	Daily Minimum Temperature Flag
29	b.	Blank
30-35	bb-12.0	Daily Mean Temperature (-12.0 Deg C)
36	b.	Blank
37	0.	Daily Mean Temperature Flag
38	b.	Blank
39-44	bbb-4.3	Daily Maximum Temperature (-4.3 Deg C)
45	b.	Blank
46	0.	Daily Maximum Temperature Flag

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47	b.	Blank
48-51	bb21	Daily Precipitation (2.1mm)
52	b.	Blank
53	0.	Daily Precipitation Quality Flag
54	b.	Blank
55	0.	Daily Precipitation Measurement Flag
56	?.	Not Used

IWMO is an integer variable that refers to the WMO Number for this station. See table 1 for a list of the 223 WMO numbers contained in this data set along with the station's associated name, latitude, longitude, elevation, and year when data begins.

IYEAR is an integer variable that refers to the year of the data record. Range of values is 1881-1993

IMON is an integer variable that refers to the month of the data record. Range of values is 01-12.

IDAY is an integer variable that refers to the day of the month. Range of values is 01-31.

ITFLG is a numeric variable that refers to the internal consistency of the air temperature data group flag for the day. The allowable values are 0-9 and are defined as follows:

0: if minimum (<=) mean (<=) maximum
0: if minimum (<=) maximum and mean absent
0: if minimum (<=) mean and maximum absent
0: if mean (<=) maximum and minimum absent
1: if minimum (<)maximum (<=) mean
2: if mean (<=) minimum (<) maximum
3: if mean (<=) maximum (<) minimum
4: if maximum (<) minimum (<=) mean
5: if maximum (<=) mean (<) minimum
6: if mean (<) minimum and maximum absent
7: if maximum (<) minimum and mean absent
8: if maximum (<) mean and minimum absent
9: if minimum, maximum and/or mean are absent

RMIN is a real variable that refers to the daily minimum temperature in tenths of a degree Celsius. Temperature observations were taken eight times a day from 1966-93, four times a day from 1936-65, and three times a day from 1881-1935. Daily maximum/minimum temperatures were derived from maximum/minimum thermometer measurements.

IMINF is an integer variable that refers to the quality flag assigned to the minimum temperature. The allowable values are 0, 2, and 9 and are defined as follows:

0: valid value

2: suspect value
9: rejected value or observation not made. When IMINF is 9, RMIN is assigned 9999.9.

RMEAN is a real variable that refers to the daily mean temperature in tenths of a degree Celsius. Temperature observations were taken eight times a day from 1966-93, four times a day from 1936-65, and three times a day from 1881-1935. Daily mean temperature is defined as the average of all observations for each calendar day.

IMEANF is an integer variable that refers to the quality flag assigned to the mean temperature. The allowable values are 0, 2, and 9 and are defined as follows:

0: valid value
2: suspect value
9: rejected value or observation not made. When IMEANF is 9, RMEAN is assigned 9999.9.

RMAX is a real variable that refers to the daily maximum temperature in tenths of a degree Celsius. Temperature observations were taken eight times a day from 1966-93, four times a day from 1936-65, and three times a day from 1881-1935. Daily maximum/minimum temperatures were derived from maximum/minimum thermometer measurements.

IMAXF is an integer variable that refers to the quality flag assigned to the maximum temperature. The allowable values are 0, 2, and 9 and are defined as follows:

0: valid value
2: suspect value
9: rejected value or observation not made. When IMAXF is 9, RMAX is assigned 9999.9.

RPRCP is a real variable that refers to the daily precipitation (tenths of millimeters implied decimal point). Changes in the time of observation occurred in 1936, 1966, and 1986. Before 1936, rainfall was measured only at 0700 LMT. From 1936-65, gauges were checked at 0700 and 1900 LMT. Beginning in 1966, the time of observation became time-zone dependent (the USSR being comprised of 11 time zones). In particular, from 1966-85, readings were taken at 0300, 0900, 1500, and 2100 MLT in zone 2 (i.e., Moscow); at 0300, 0600, 1500, and 1800 MLT in zones 3-5; at 0300 and 1500 MLT in zones 6-8; at midnight, 0300, 1200, and 1500 MLT in zones 9-11; and at 2100, 0300, 0900, and 1500 MLT in zone 12 (the easternmost part of the USSR). In 1986, the 0300 and 1500 MLT observations were discontinued in all but the second time zone.

IPRCP1 is an integer variable that refers to the measurement flag assigned to the precipitation total. The allowable values are 0-3 and are defined as follows:

0: precipitation total is 0.1 mm or more
1: precipitation value represents a multiple day total (accumulated)
2: observations were made but there was no precipitation. RPRCP is assigned zero.
3: a small precipitation amount of less than 0.1 mm. RPRCP is assigned zero.

IPRCP2 is an integer variable that refers to the quality flag assigned to the precipitation total. The allowable values are 0-3 and are defined as follows:

0: valid value
2: suspect value
9: rejected value or observation not made. When IPRCP2 is 9, RPRCP is assigned 9999

Table 1

WMO#	Station name	Lat.	Long.	Elev. (M)	Year Data Begins
20674	OSTROV DIKSON	73.50	80.40	42.0	1936
20891	HATANGA.	71.98	102.47	30.0	1928
21946	COKURDAH	70.62	147.88	0.0	1944
21982	OSTROV VRANGELJA	70.97	-178.37	2.0	1926
22113	MURMANSK	68.97	33.05	57.0	1936
22217	KANDALAKSA	67.13	32.43	26.0	1912
22522	KEM'-PORT	64.98	34.78	7.3	1916
22550	ARHANGEL'SK	64.58	40.50	8.0	1881
22583	KOJNAS	64.75	47.65	63.0	1912
22602	REBOLY	63.82	30.82	179.0	1910
22641	ONEGA	63.90	38.12	11.0	1936
22802	SORTOVALA	61.72	30.72	17.0	1945
22820	PETROZAVODSK	61.82	34.27	110.0	1936
22837	VYTEGRA	61.02	36.45	55.0	1881
22887	KOTLAS	61.23	46.63	56.0	1936
23146	MYS KAMENNYJ	68.47	73.60	2.0	1950
23205	NAR'JAN-MAR	67.65	53.02	5.0	1926
23219	HOSEDA-HARD	67.08	59.38	82.0	1936
23405	UST'-CIL'MA	65.45	52.17	72.0	1892
23418	PECORA	65.12	57.10	54.5	1943
23472	TURUHANSK	65.78	87.95	37.0	1960
23631	BEREZOVO	63.93	65.05	27.0	1936
23711	TROICKO-PECERSKOE	62.70	56.20	135.0	1888
23724	NJAKSIMVOL'	62.43	60.87	50.0	1936
23804	SYKTYVKAR	61.67	50.85	96.0	1888
23849	SURGUT	61.25	73.50	44.0	1884
23884	BOR	61.60	90.00	62.0	1936
23891	BAJKIT	61.67	96.37	256.0	1936
23921	IVDEL'	60.68	60.43	93.0	1934
23933	HANTY-MANSIJSK	60.97	69.07	45.0	1892
23955	ALEKSANDROVSKOE	60.43	77.87	47.0	1936
24125	OLENEK	68.50	112.43	216.5	1936
24266	VERHOJANSK	67.55	133.38	136.0	1885
24343	ZIGANSK	66.77	123.40	88.0	1936
24507	TURA	64.17	100.07	188.0	1928
24641	VILJUJSK	63.77	121.62	110.8	1898
24688	OJMJAKON	63.27	143.15	740.0	1943
24738	SUNTAR	62.15	117.65	131.0	1936
24817	ERBOGACEN	61.27	108.02	284.0	1936
24908	VANAVARA	60.33	102.27	259.0	1932
24944	OLEKMINSK	60.40	120.42	223.0	1882
24951	ISIT'	60.82	125.32	117.0	1936
24959	JAKUTSK	62.08	129.75	98.5	1888
24966	UST'-MAJA	60.38	134.45	169.0	1897

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25173	MYS SMIDTA	68.92	-179.48	3.3	1936
25551	MARKOVO	64.68	170.42	25.0	1894
25563	ANADYR'	64.78	177.57	64.0	1898
25594	BUHTA PROVIDENJA	64.43	-173.23	9.0	1936
25703	SEJMCAN	62.92	152.42	206.0	1936
25744	KAMENSKOE	62.48	166.22	33.0	1950
25913	MAGADAN	59.58	150.78	115.0	1936
25954	KORF	60.35	166.00	2.0	1929
26038	TALLIN	59.42	24.80	41.0	1936
26063	LENINGRAD TOWN/VILLE	59.97	30.30	4.0	1881
26188	VEREB'E	58.68	32.70	116.0	1936
26231	PJARNU	58.38	24.50	1.0	1936
26258	PSKOV	57.83	28.35	42.0	1936
26406	LIEPAJA	56.55	21.02	4.0	1881
26422	RIGA	56.97	24.07	7.0	1943
26477	VELIKIE LUKI	56.38	30.60	98.0	1881
26629	KAUNAS	54.88	23.88	76.0	1922
26702	KALININGRAD	54.70	20.62	20.0	1947
26730	VIL'NJUS	54.63	25.28	162.0	1881
26781	SMOLENSK	54.75	32.07	236.0	1944
26850	MINSK	53.87	27.53	222.0	1891
27037	VOLOGDA	59.28	39.87	125.0	1938
27196	KIROV	58.65	49.62	165.0	1881
27333	KOSTROMA	57.73	40.95	137.0	1925
27553	GOR'KIJ	56.22	43.82	161.0	1881
27595	KAZAN'	55.78	49.18	116.0	1881
27612	MOSKVA	55.75	37.57	147.0	1948
27648	ELAT'MA	54.95	41.77	132.0	1886
27823	PAVELEC	53.78	39.25	209.0	1936
27947	TAMBOV	52.73	41.47	139.0	1936
28064	LEUSI	59.62	65.78	72.8	1936
28138	BISER	58.52	58.85	463.0	1888
28225	PERM	58.02	56.30	169.0	1882
28275	TOBOL'SK	58.15	68.18	48.5	1884
28411	IZEVSK	56.82	53.27	155.0	1958
28434	KRASNOUFIMSK	56.62	57.75	20.6	1936
28440	SVERDLOVSK	56.80	60.63	282.0	1881
28493	TARA	56.90	74.38	73.0	1936
28661	KURGAN	55.47	65.40	70.0	1893
28679	PETROPAVLOVSK	54.83	69.15	134.0	1890
28698	OMSK	54.93	73.40	121.0	1916
28722	UFA	54.75	56.00	104.0	1900
28900	KUJBYSEV BEZENCUK	53.25	50.45	137.0	1936
28952	KUSTANAJ	53.22	63.62	169.0	1902
29231	KOLPASEV	58.30	82.90	80.0	1936
29263	ENISEJSK	58.45	92.15	77.0	1884
29282	BOGUCANY	58.42	97.40	134.0	1930
29430	TOMSK	56.43	84.97	137.0	1890
29574	KRASNOJARSK	56.00	92.88	274.0	1914
29612	BARABINSK	55.37	78.40	120.0	1900
29698	NIZNE-UDINSK	54.88	99.03	410.0	1966
29807	IRTYSSK	53.35	75.45	93.0	1936
29838	BARNAUL	53.33	83.70	153.0	1959
29866	MINUSINSK	53.70	91.70	251.0	1910
30054	VITIM	59.45	112.58	186.3	1928
30230	KIRENSK	57.77	108.12	256.0	1892
30253	BODAJBO	57.85	114.20	278.0	1936

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30372	CARA	56.92	118.37	708.0	1938
30393	CUL'MAN	56.83	124.87	843.9	1936
30521	ZIGALOVO	54.80	105.17	426.0	1937
30555	TROICKIJ PRIISK	54.62	113.13	1315.0	1938
30636	BARGUZIN	53.62	109.63	488.0	1898
30673	MOGOCA	53.73	119.78	624.0	1910
30692	SKOVORODINO	54.00	123.97	397.5	1912
30710	IRKUTSK	52.27	104.35	467.0	1882
30758	CITA	52.02	113.33	471.0	1890
30777	SRETENSK	52.27	117.70	528.0	1936
30823	ULAN-UDE	51.80	107.43	514.0	1886
30925	KJAHTA	50.37	106.45	791.0	1895
30949	KYRA	49.57	111.97	907.0	1927
30965	BORZJA	50.38	116.52	675.0	1901
31004	ALDAN	58.62	125.37	678.0	1937
31088	OHOTSK	59.37	143.20	5.0	1891
31168	AJAN	56.45	138.15	7.0	1931
31253	BOMNAK	54.72	128.93	357.0	1909
31329	EKIMCAN	53.07	132.93	540.0	1914
31369	NIKOLAEVSK-NA-AMURE	53.15	140.70	46.0	1881
31388	NORSK	52.35	129.92	207.0	1925
31416	IM POLINY OSIPENKO	52.42	136.50	71.0	1936
31510	BLAGOVESCENSK	50.27	127.50	130.0	1881
31532	CEKUNDA	50.82	132.17	271.0	1936
31594	ARHARA	49.42	130.08	133.0	1936
31707	EKATERINO-NIKOL'SKOE	47.73	130.97	72.0	1966
31735	HABAROVSK	48.52	135.17	88.0	1952
31829	MYS ZOLOTOJ	47.32	138.98	27.0	1936
31873	DAL'NERECENSK	45.87	133.73	97.0	1939
31909	TERNEJ	45.03	136.67	51.0	1923
31915	POGRANICNYJ	44.40	131.38	217.0	1902
31960	VLADIVOSTOK	43.12	131.90	183.0	1914
32061	ALEKSANDROVSK -SAHALINSKIJ	50.90	142.17	30.0	1881
32098	PORONAJSK	49.22	143.10	7.0	1908
32165	JUZNO-KURULUSK	44.02	145.82	44.0	1947
32389	KLJUCI	56.32	160.83	28.0	1914
32411	ICA	55.70	155.63	10.0	1936
32540	PETROPAVLOVSK -KAMCATSKIJ	52.97	158.75	-999.9	1894
32564	OKTIABR'SKAYA	52.67	156.23	6.0	1914
33008	BREST	52.12	23.68	141.0	1902
33038	VASILEVICI	52.25	29.83	139.0	1881
33345	KIEV	50.40	30.45	167.0	1881
33377	LUBNY	50.02	33.00	156.0	1936
33393	L'VOV	49.82	23.95	326.0	1936
33562	VINNICA	49.23	28.47	281.0	1936
33631	UZGOROD	48.63	22.27	115.0	1946
33658	CERNOVCY	48.27	25.97	239.0	1941
33815	KISINEV	47.02	28.87	173.0	1886
33837	ODESSA	46.48	30.63	42.0	1894
33889	IZMAIL	45.37	28.87	28.0	1886
33910	GENICESK	46.17	34.82	14.0	1883
33915	ASKANIJA-NOVA	46.45	33.88	28.0	1910
33946	SIMFEROPOL'	45.02	33.98	204.0	1955
33976	FEODOSIJA	45.03	35.38	22.0	1881
33983	KERC'	45.37	36.43	32.0	1936

34009	KURSK	51.65	36.18	246.0	1891
34122	VORONEZ	51.70	39.17	147.0	1918
34139	KAMENNAJA STEP'	51.05	40.70	193.0	1893
34163	OKTJABR'SKIJ GORODOK	51.63	45.45	202.0	1881
34172	SARATOV	51.57	46.03	126.0	1936
34300	HAR'KOV	49.93	36.28	147.0	1936
34391	ALEKSANDROV-GAJ	50.15	48.55	23.0	1936
34524	DEBAL'CEVO	48.35	38.43	334.0	1936
34646	VOLGODONSK	47.73	42.25	64.0	1952
34731	ROSTOV-NA-DONU	47.25	39.82	66.0	1886
34747	CELINA	46.55	41.05	111.0	1936
34824	PRIMORSKO-AHTARSK	46.03	38.15	3.0	1959
34861	ELISTA	46.32	44.30	151.0	1927
34880	ASTRAHAN'	46.27	48.03	-22.0	1881
35078	ATBASAR	51.82	68.37	303.0	1936
35108	URAL'SK	51.25	51.40	36.0	1900
35121	ORENBURG	51.75	55.10	115.0	1886
35133	ADAMOVKA	51.52	59.95	285.0	1936
35188	CELINOGRAD	51.13	71.37	347.0	1881
35229	AKTJUBINSK	50.28	57.15	219.0	1904
35358	TURGAJ	49.63	63.50	124.0	1900
35394	KARAGANDA	49.80	73.13	550.0	1936
35406	KALMYKOVO	49.05	51.87	1.0	1925
35416	UIL	49.07	54.68	88.0	1925
35542	IRGIZ	48.62	61.27	114.0	1936
35576	KZYL-ZAR	48.30	69.65	488.0	1926
35700	GUR'EV	47.02	51.85	-24.0	1881
35746	ARAL'SKOE MORE	46.78	61.67	62.0	1905
35796	BALHAS	46.90	75.00	347.0	1936
36034	RUBCOVSK	51.50	81.22	216.0	1936
36177	SEMIPALATINSK	50.35	80.25	195.0	1901
36665	ZAJSAN	47.47	84.92	604.0	1936
36729	UC-ARAL	46.17	80.93	397.0	1937
36859	PANFILOV	44.17	80.07	641.0	1917
36870	ALMA-ATA	43.23	76.93	847.0	1915
36974	NARYN	41.43	76.00	2039.0	1913
37031	ARMAVIR	44.98	41.12	158.0	1936
37050	PJATIGORSK	44.05	43.03	531.0	1934
37099	SOCI	43.58	39.72	57.0	1881
37235	GROZNYJ	43.35	45.68	123.0	1938
37385	SAMTREDIA	42.18	42.37	28.0	1936
37472	MAHACKALA	43.02	47.43	-21.0	1882
37549	TBILISI	41.68	44.95	427.0	1881
37686	LENINAKAN	40.78	43.83	1523.0	1895
37735	KIROVABAD	40.72	46.42	308.0	1882
37789	EREVAN	40.13	44.47	888.0	1885
38198	TURKESTAN	43.27	68.22	206.0	1882
38262	CIMBAJ	42.95	59.82	64.7	1937
38353	FRUNZE	42.83	74.58	756.0	1936
38413	TAMDY	41.73	64.62	236.0	1932
38457	TASKENT	41.27	69.27	477.0	1881
38507	KRASNOVODSK	40.03	52.98	89.0	1936
38599	LENINABAD	40.22	69.73	425.0	1936
38618	FERGANA	40.37	71.75	577.8	1881
38687	CARDZOU	39.08	63.60	188.0	1894
38696	SAMARKAND	39.57	66.95	725.0	1936
38750	GASAN-KULI	37.47	53.97	-24.0	1926

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38763	KIZYL-ARVAT	38.98	56.28	97.0	1883
38836	DUSANBE	38.58	68.78	796.0	1926
38880	ASHABAD	37.97	58.33	227.0	1937
38895	BAJRAM-ALI	37.60	62.18	240.0	1889
38927	TERMEZ	37.23	67.27	309.0	1927
38933	KURGAN-TJUBE	37.82	68.78	427.0	1936
38954	HOROG	37.50	71.50	2077.0	1898
38974	SERAHS	36.53	61.22	275.0	1936
38987	KUSKA	35.28	62.35	625.0	1904

3. Start Date: 18819999. Most stations begin in 1936

4. Stop Date: 19939999

5. Coverage: the former USSR

a. Southernmost Latitude: 35 Degrees 00 Min. N Latitude
b. Northernmost Latitude: 74 Degrees 00 Min. N Latitude
c. Westernmost Longitude: 20 Degrees 00 Min. E Longitude
d. Easternmost Longitude: 173 Degrees 00 Min. W Longitude

6. How to Order Data:

Ask NCDC's Climate Services about the cost of obtaining this data set.
Phone: 828-271-4800
FAX: 828-271-4876
E-mail: **NCDC.Orders@noaa.gov**

7. Archiving Data Center:

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

8. Technical Contact:

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, NC 28801-5001
Phone: (828) 271-4800.

9. Known Uncorrected Problems: An extensive quality control of these data was performed by the Carbon Dioxide Information Analysis Center (CDIAC)in 1993 and some problems were found. CDIAC examined the actual daily data values for reasonableness. In particular, minimum, mean, and maximum temperature on each day were compared to verify that the minimum was less than or equal to the mean and that the mean was less than or equal to the maximum. For 4544 days scattered more than 220 stations, this relationship was violated. Extreme value checks were applied to identify negative rainfall totals and temperatures that exceeded known world-record values (i.e., temperatures below -73 C or above 58 C). As a result, 230 minimum and 13 maximum temperature observations were found. Precipitation totals above 500 mm were also checked for reasonableness, though none were flagged as problematic.

In addition, CDIAC found 13 stations that had extensive data problems and should be used with caution. These are listed below:

WMO# 24266 From 1895-1920, there are few maximum temperature values greater than -36 C; thereafter, numerous values are greater than -36 C.

WMO# 24641 From 1900-1930, there are few maximum temperature values greater than -36 C; thereafter, numerous values are greater than -36 C.

WMO# 24944 From 1900-1930, there are few maximum temperature values greater than -36 C; thereafter, numerous values are greater than -36 C.

WMO# 24959 From 1888-1927, there are few maximum temperature values greater than -36 C; thereafter, numerous values are greater than -36 C.

WMO# 24966 From 1897-1901, there are few mean temperature values less than -40 C; thereafter, numerous values are less than -40 C.

WMO# 25551 From 1894-1898, there are few minimum, mean, and maximum temperature values less than -40 C; thereafter, numerous values are less than -40 C.

WMO# 26406 From 1881-1886, numerous precipitation totals are equal to 0; thereafter, far fewer values are equal to 0.

WMO# 30823 In 1896, several precipitation totals are anomalously large.

WMO# 31510 In 1928, several minimum temperature values are anomalously high.

WMO# 36177 From 1918-1921, many precipitation totals are only recorded to the nearest millimeter.

WMO# 37472 From 1898-1911, many minimum temperatures are only recorded to the nearest degree Celsius.

WMO# 38895 In 1889, many maximum temperature values are anomalously high.

WMO# 38954 In 1910, several precipitation totals are anomalously large.

10. Quality Statement: An extensive quality control of these data was performed by Carbon Dioxide Information Analysis Center in 1993 and some problems were found. They are described in topic 16 of this document. In addition, the Russian data center from which these data were received conducted extensive manual and automated quality assurance assessments prior to these data being exchanged with the National Climatic Data Center.

11. Essential Companion Datasets: A WMO station identifier list is required in order to determine metadata (name, location, elevation, etc.) on each WMO station identifier number (positions 1-5 in the digital data file). A cross reference list of the WMO numbers listed in this data set is also provided in this document (table 1).

12. References:

Razuvaev, V.N., E.G. Apasova, R.A. Martuganov, R.S. Vose, and P.M. Steurer,

1993: *Daily Temperature and Precipitation Data for 223 USSR Stations.* ORNL/CDIAC NDP-040. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, Oak Ridge, Tennessee, 127 pp.