



Nuestra ref.: 16953/2021/S/CS/CMP/CLINO9120 4 de agosto de 2021

Anexos: 2 (disponibles en inglés solamente)

Asunto: Recopilación de las normales climatológicas estándares de la OMM para el período 1991-2020

Finalidad: Presentar los datos requeridos con la mayor brevedad a partir del 1 de octubre de 2021 pero, en todo caso, **no más tarde del 31 de marzo de 2022**

Estimado señor/Estimada señora:

Quisiera informarle que se han adoptado las disposiciones necesarias a fin de que la Organización Meteorológica Mundial (OMM) recopile las normales climatológicas estándares para el período 1991-2020. Como tal vez recuerde, el Decimoséptimo Congreso Meteorológico Mundial, celebrado en 2015, decidió, mediante la [Resolución 16 \(Cg-17\)](#) — Informe de la decimosexta reunión de la Comisión de Climatología, mejorar la definición de "normal climatológica estándar". Así, la normal climatológica estándar se refiere al período de 30 años más reciente que concluye en un año acabado en 0 (1981-2010, 1991-2020, etc.) y sustituye a la anterior definición, que utilizaba períodos de 30 años no superpuestos (1931-1960, 1961-1990, etc.). En el [anexo 1](#) figura información general sobre el particular y se abordan las enseñanzas extraídas de la recopilación de las normales climatológicas estándares más reciente, que corresponde al período 1981-2010.

Si bien se anima encarecidamente a los Miembros a que cumplan con el nuevo estándar lo antes posible, la OMM sigue recopilando las normales climatológicas estándares con el fin de establecer un fondo mundial de estándares comparables y accesibles. La Oficina Nacional de Administración Oceánica y Atmosférica (NOAA) de los Estados Unidos de América aceptó generosamente seguir recopilando y publicando, a través de sus Centros Nacionales de Información Ambiental (NCEI) y en nombre de la OMM, las normales climatológicas estándares a nivel mundial.

Por ello, le invito a que presente las normales climatológicas estándares para el período 1991-2020 de tantas estaciones de su país como sea posible, incluidas las estaciones registradas en la Herramienta de Análisis y Examen de la Capacidad de los Sistemas de Observación en Superficie ([OSCAR/Superficie](#)) y, en particular, las estaciones i) que constituyen las Redes Climatológicas Básicas Regionales (RCBR), ii) las que emiten mensajes CLIMAT mensuales, y iii) las que contribuyen a la recopilación de los Registros Meteorológicos Mundiales.

Se ruega que calcule y digitalice los datos, y que los presente en formato de texto o de hoja de cálculo Excel, de conformidad con la orientación proporcionada en las [Directrices de la Organización Meteorológica Mundial sobre el cálculo de las normales climáticas](#) (OMM-Nº 1203), así como en las directrices para la presentación de las normales climatológicas estándares de la OMM que se adjuntan a la presente carta ([anexo 2](#)). Se publica [en línea](#) información adicional, con inclusión de las plantillas de archivos EXCEL y de texto.

A los Representantes Permanentes de los Miembros ante la OMM

Copias: presidentes de las asociaciones regionales
presidente y vicepresidentes de la SERCOM
presidente y vicepresidentes de la INFCOM
Centros Nacionales de Información Ambiental (NCEI), Asheville

Para facilitar la publicación de las normales climatológicas de las OMM para el período 1991-2020, le agradecería que envíe a la Secretaría de la OMM (wcdmp@wmo.int) su contribución con la mayor brevedad a partir del 1 de octubre de 2021 pero, en todo caso, **no más tarde del 31 de marzo de 2022**. Sírvase utilizar el siguiente asunto cuando envíe su contribución: "CLINO [nombre del país/territorio]" (ejemplo: CLINO Alemania).

Si requiriese mayor información, no dude en ponerse en contacto con la Secretaría de la OMM (señor Peer Hechler, funcionario científico, Departamento de Servicios/Sección de Servicios Climáticos/División de Servicios de Monitoreo del Clima y Políticas Climáticas) por correo electrónico a la dirección wcdmp@wmo.int.

Le saluda atentamente.



Doctora Elena Manaenkova
por el Secretario General

Background information

Purposes of Climate Normals

Climate normals are used for two principle purposes. They are widely used, implicitly or explicitly, as a characterization – including for the near-future – of the average conditions most likely to be experienced in a given location. They are also used as a benchmark against which recent or current weather or climate conditions can be compared, including providing a basis for many anomaly-based climate datasets such as global mean temperature anomalies (... year xy was z degrees too warm/too cold ...).

New definition of Climatological Standard Normal and introduction of WMO Reference Period for long-term climate change assessment

In the past, Climatological Standard Normals had referred to non-overlapping 30-year periods (1901-30, 1931-60 and 1961-90). The Seventeenth World Meteorological Congress in 2015, through [Resolution 16 \(Cg-17\)](#) – Report of the Sixteenth Session of the Commission for Climatology, endorsed the following update of the definition of a Climatological Standard Normal:

Averages of climatological data computed for the following consecutive periods of 30 years: 1 January 1981 – 31 December 2010, 1 January 1991 – 31 December 2020, and so forth.

Congress also agreed to introduce a WMO Reference Period for long-term climate change assessment: *The consecutive period of 30 years from 1 January 1961 to 31 December 1990.*

Main reason for updating the definition of Climatological Standard Normals

It has been recognized widely that the historic method of calculating Climatological Standard Normals (30-year normal updated every 30 years) leads to a reference standard that in a changing climate is unlikely to provide good guidance for most climate applications. For example, using 1961-90 Climatological Standard Normal as reference in 2022 for a climate application on energy demands in the years 2023 to 2025 is likely to lead to an inaccurate conclusion. The same application is likely to provide much more accurate results with 1991-2020 Climatological Standard Normal as reference.

There are, however, certain areas in climatology where a relatively stable reference period is required, notably in long-term climate variability assessment and climate change monitoring. Therefore, the consecutive period of 30 years from 1 January 1961 to 31 December 1990 is retained as a reference period for long-term climate change assessment.

Implications of modifying the definition of Climatological Standard Normals

Updating Climatological Standard Normals requires dedicated explanation to users; related items of communication may include the following aspects and examples:

- The need for the update: To ensure a better representation of the average conditions at a given location, particularly for many sectoral operational climate applications and services.
- The implications of the update: Example: A region experienced a distinct warming over the last one to two decades. Operational climate monitoring using 1961-1990

A los Representantes Permanentes de los Miembros ante la OMM

Copias: presidentes de las asociaciones regionales
 presidente y vicepresidentes de la SERCOM
 presidente y vicepresidentes de la INFCOM
 Centros Nacionales de Información Ambiental (NCEI), Asheville

Climatological Standard Normals has identified most of the past years as 'warmer than normal'. By switching to the 1991–2020 Climatological Standard Normal, which is likely higher than the 1961–1990 Climatological Standard Normal, the number of years characterized as 'warmer than normal' may be less and a greater number of 'normal' or 'cooler than normal' years may appear.

- Obviously, the above example does not indicate necessarily that the warming trend in this region has been slowed down, stopped or reversed. The example illustrates, however, that warmer average conditions are expected, and conditions today are better reflected by using the 1991–2020 Climatological Standard Normal compared to 1961–1990.
- Stable reference for climate change assessments: For long-term climate variability and change assessment (time scale of decades) it is recommended to use the (newly defined) WMO Reference Period 1961–1990 (to be used internationally in perpetuity or unless compelling scientific reasons suggest its modification).

It is recommended to publish the list of NMHS (standard) products that use updated Climatological Standard Normals including the date of the switch-over from the previous (e.g. 1961–1990 or 1981–2010) to the updated (e.g. 1991–2020) Normal. Moreover, it is strongly recommended to explicitly mention the Climatological Standard Normal in use on all products affected.

**GUIDELINES FOR THE SUBMISSION OF WMO CLIMATOLOGICAL STANDARD
NORMALS: COLLECTION FOR 1991-2020**

Ref.: 18168/2021-1.0 GS

This document, the EXCEL template with example, the ASCII *.csv with example, and a copy of WMO-No. 1203 are located at:

<https://www.ncei.noaa.gov/pub/data/normals/WMO/>

CONTENTS

	<i>Page</i>
1. BACKGROUND.....	1
1.1. World Meteorological Organization climate normals	1
1.2 Submission channels	1
2. METHODOLOGY FOR REPRESENTING THE CLIMATOLOGICAL STANDARD NORMALS FOR 1991-2020	1
2.1 Station header information	1
2.2 Statistical descriptors	2
2.3 Principal climatological surface parameters and units	3
2.4 Secondary and other climatological surface parameters and units	4
3. EXCEL SUBMISSION FOR EACH STATION RECORD	7
4. ASCII SUBMISSION IN COMMA SEPARATED VALUES FORMAT (*.CSV)	9
5. SUBMISSION OF EXPLANATORY NOTES.....	10
REFERENCES	10
ATTACHMENT I: EXAMPLE EXCEL FILE (SINGLE STATION PER TAB)	11
ATTACHMENT II: EXAMPLE ASCII FILE IN *.CSV FORMAT (SINGLE STATION PER FILE).....	12

1. BACKGROUND

This document provides technical instructions for submitting Climatological Standard Normals for the most recent 30-year period ending in "0", 1991–2020. Brief background material for this activity is provided below, followed by uniform collection instructions.

1.1 World Meteorological Organization Climate Normals

In 2015, the Seventeenth World Meteorological Congress (WMO, 2015) approved a change in formal practice to calculate Climatological Standard Normals every ten years, rather than in non-overlapping 30-year periods (Resolution 16 [Cg-17]). In 2017, WMO published [WMO Guidelines on the Calculation of Climate Normals](#) (WMO-No. 1203) that provides updated methodological instructions for these calculations (WMO, 2017). The combination of these progressive steps provides an opportunity to collect globally Climatological Standard Normals for the period 1991–2020. These Normals will be gathered and housed for global access at the U.S. National Oceanic and Atmospheric Administration as done during the mid-1990s, when 1961–1990 Climatological Standard Normals were collected for the WMO and are still available at the World Data Center for Meteorology Asheville website: <https://www.ncei.noaa.gov/products/wmo-climate-normals>.

The current normals collection will be based on the WMO-No. 1203 guidance and definitions. For the definitions of climate elements and parameters and methods for their calculations, readers should refer to WMO-No. 1203 and its underlying source documents. This document will merely describe the submission process and format.

1.2 Submission channels

WMO Members should make submissions to the WMO Secretariat email account at wcdmp@wmo.int. Each WMO Member has an option to submit station files in EXCEL format or Comma Separated Values (*.csv ASCII text) format as attachments to electronic mail. Example files of each type can be seen in [Attachment I](#) and [Attachment II](#).

2. METHODOLOGY FOR REPRESENTING THE CLIMATOLOGICAL STANDARD NORMALS FOR 1991–2020

2.1 Station header information

Each file submitted can contain Climatological Standard Normals for many different variables but should be limited to only one station per tab when providing data in EXCEL format or one station per file when providing data in ASCII *.csv format. The EXCEL file format is simple and compatible to most versions of EXCEL. Each tab or file header should contain the following information:

Station Header Record

Row 6: Country Name – Column B

Row 7: Station Name – Column B

Row 10: WMO Number – Column A formatted as five digit number
 Latitude – Column B formatted as deg|min|sec|N or S
 Longitude – Column C formatted as deg|min|sec|E or W
 Station_Height – Column D formatted in whole meters (using "-" below sea level)

Row 13: WIGOS Station ID (if available) – Column A formatted as 12 digits

The EXCEL file template provides sufficiently wide columns for all input types with standard EXCEL Calibri 12-point font. Labels are provided for each field and row spaces separate fields ([Attachment I](#)). The same approach can be used in constructing a *.csv file ([Attachment II](#)).

2.2 Statistical Descriptors

A parameter is a statistical descriptor of a climate element. Most observed elements are formed into means, sums, or counts for understanding the state of the element for a representative calendar month. WMO-No. 1203 describes the most fundamental parameter calculation methods, which are listed in Table 1(a).

Table 1(a) Calculation method names (abbreviated), codes, and parameter calculation method descriptions from *WMO Guidelines on the Calculation of Climate Normals* (WMO-No. 1203)

Calculation _Name	Calculation _Code	Parameter calculation method descriptions from WMO-No. 1203
Mean	1	Mean Parameter - mean of daily values during the month
Max	2	Extreme Parameter Maximum - highest value during month
Min	3	Extreme Parameter Minimum - lowest value during month
Sum	4	Sum Parameter - sum of daily values during month
Count	5	Count Parameter - Number of days (cf. section 2.3 below)
Q0	6	Quintile Parameter 0 - Lower bound of quintile 1 (Extreme Minimum)
Q1	7	Quintile Parameter 1 - Upper bound of quintile 1
Q2	8	Quintile Parameter 2 - Upper bound of quintile 2
Q3	9	Quintile Parameter 3 - Upper bound of quintile 3
Q4	10	Quintile Parameter 4 - Upper bound of quintile 4
Q5	11	Quintile Parameter 5 - Upper bound of quintile 5 (Extreme Maximum)

There are also some additional parameter calculation methods provided in Table 1(b) that are derived from the 1961–1990 Climatological Standard Normals collection effort. Some Members may also wish to use these statistics, especially the “Number of Years Used to Calculate Normal” statistic, NOY.

Table 1(b) Additional parameter calculation methods from the 1961–1990 Climatological Standard Normals collection effort

Calculation _Name	Calculation _Code	Parameter calculation method descriptions from 1961–1990 normals
Mediana	12	Median Monthly Value
SDMean	13	Standard Deviation of Mean Monthly Value
SDMeanD	14	Standard Deviation of Mean Daily Value
MaxDate	15	Date (Year/Day) of Occurrence of Extreme Maximum Daily Value
MinDate	16	Date (Year/Day) of Occurrence of Extreme Minimum Daily Value
MinMon	17	Minimum Monthly Value
DMinMon	18	Year of Occurrence of Minimum Monthly Value
MaxMon	19	Maximum Monthly Value

DMaxMon	20	Year of Occurrence of Maximum Monthly Value
NOY	98	Number of Years Used to Calculate Normal
Custom	99	Custom Parameter or Statistic Specified by Contributor

2.3 Principal climatological surface parameters and units

Climate parameters are defined as an aspect of climate that can be statistically described, such as mean air temperature, precipitation total, or mean sea level pressure. Subject to limitations on available data, there are eight principal climatological surface parameters (Table 2) that should always be reported in station climate normals submissions if possible. The EXCEL submission template contains these fields (as well as the secondary parameters). The suggested submission format includes the use of the parameter name in a header above a data table. In order to assure compatibility between EXCEL and ASCII *.csv submissions, parameter name words are linked by underscores with no spaces, and units of temperature are spelled out in basic ASCII characters (Deg_C). Finally, it should be noted that additional climatological surface parameters derived for the same element but using a different calculation method (e.g. median precipitation total, extreme maximum daily maximum temperature, etc.) can be reported on additional spreadsheet rows in conjunction with each principal climatological surface parameter.

Table 2. Principal climatological surface parameters from *WMO Guidelines on the Calculation of Climate Normals* (WMO-No. 1203)

Parameter _Code	Parameter_Name	Units
1	Precipitation_Total	mm
2	Number_of_Days_with_Precipitation_≥_1 mm	count
3	Daily_Maximum_Temperature	Deg_C
4	Daily_Minimum_Temperature	Deg_C
5	Daily_Mean_Temperature	Deg_C
6	Mean_Sea_Level_Pressure	hPa
7	Mean_Vapor_Pressure	hPa
8	Total_Number_of_Hours_of_Sunshine	hours

While it is very important for Members submitting normals data to review all recommended calculation instructions in WMO-No. 1203, the treatment of "count" variables is especially noteworthy and so will be reviewed here. Normals for counts should be calculated as follows (cf. section 4.3 of WMO-No. 1203):

- (a) The count of values for each individual month should be calculated, and converted to a percentage of days with available observations. (For example, if there were 25 days with observations in February 1991 and there were 22 days with temperatures $\geq 30^{\circ}\text{C}$, the value for February 1991 is calculated as 88%).
- (b) The average percentage count for each month with sufficient available data within the 1991–2020 period is calculated.
- (c) This average is then reconverted to an average number of days for the month by multiplying the average percentage by the number of days in the month. February percentages should be multiplied by 28.25.
- (d) The sum of the monthly normals as per above instructions constitutes the annual normal.

The purpose of this procedure is to prevent the underestimation of count variables as a result of missing data within a month.

2.4 Secondary and other climatological surface parameters and units

Secondary climatological surface parameters (Table 3) are generally well recognized from standard CLIMAT messages and other common sources. Many are counts exceeding a threshold of temperature, precipitation, or wind. When parameter names with the term "threshold" are used, that word should be replaced with the numerical value representing the threshold being tested.

Table 3. Secondary climatological surface parameters from, *WMO Guidelines on the Calculation of Climate Normals* (WMO-No. 1203)

Parameter _Code	Parameter_Name	Units
10	Mean_Station-Level_Pressure	hPa
11	Boundaries_of_quintiles_of_monthly_precipitation	mm
12	Number_of_Days_with_Maximum_Temperature_≥_threshold*_ Deg_C	count
13	Number_of_Days_with_Minimum_Temperature_≤_threshold*_D eg_C	count
14	Number_of_Days_with_Maximum_Temperature_<_0_Deg_C	count
15	Number_of_Days_with_Minimum_Temperature_<_0_Deg_C	count
16	Number_of_Days_with_Daily_Precipitation_≥_threshold*_mm	count
17	Number_of_Days_with_Snow_Depth_>_threshold*_cm	count
18	Number_of_Days_with_Wind_Speed_≥_threshold*_m/s	count
19	Number_of_Days_with_Visibility_<_threshold*_m	count
20	Highest_Value_of_Mean_Daily_Temperature	Deg_C
21	Lowest_Value_of_Mean_Daily_Temperature	Deg_C
22	Highest_Value_of_Daily_Maximum_Temperature	Deg_C
23	Lowest_Value_of_Daily_Minimum_Temperature	Deg_C
24	Highest_Value_of_Daily_Precipitation	mm
25	Highest_Wind_Gust	m/s
26	Mean_Number_of_Days_with_Thunder	count
27	Mean_Number_of_Days_with_Hail	count
*For parameters with the word "threshold" specify a numerical value or qualifier, repeat as needed.		

In the "other" category, climatological surface parameters mentioned in the WMO-No. 1203 outside the principal and secondary lists are included in Table 4(a). Element-statistics combinations used to define parameters in some 1961–1990 normals submissions but not directly referenced in WMO-No. 1203 are listed in Table 4(b), often with the option of adopting user-selected thresholds for count statistics. Note that in Table 4(b), the option for parameter code 99 is available if a Member wishes to submit a climatological surface parameter that is not described in the lists available.

Table 4(a) Other climatological surface parameters from, *WMO Guidelines on the Calculation of Climate Normals* (WMO-No. 1203)

Parameter _Code	Parameter_Name	Units
30	Cloud_Amount	okta
31	Global_Solar_Radiation	MJ/m2
32	Direct_Solar_Radiation	MJ/m2
33	Diffuse_Solar_Radiation	MJ/m2
34	Wind_Speed	m/s
35	Wind_Direction	degrees
36	Soil_Temperature	Deg_C
37	Snowfall	cm
38	Relative_Humidity	%
39	Dewpoint_Temperature	Deg_C

Table 4(b). Other climatological surface parameters utilized in the 1961–1990 normals collection effort. Some provide variations on a theme, others are somewhat unique to a given country

Parameter _Code	Parameter_Name	Units
40	Cantidad de lluvia	mm
41	Bright_Sunshine	hours
42	Calm_Winds	hours
43	Number_of_Days_with_Sandstorm/Thick Dust/Haze	count
44	Number_of_Days_with_Measurable_Bright_Sunshine	count
45	Number_of_Days_with_Lightning	count
46	Number_of_Days_with_Rain_Showers	count
47	Number_of_Days_with_Snowfall	count
48	Number_of_Days_with_Fog/Ice_Fog	count
49	Number_of_Days_with_Fog_Sky_Obscured	count
50	Number_of_Days_with_Fog_Sky_Unobscured	count
51	Number_of_Days_with_Haze/Smoke	count
52	Number_of_Days_with_Dust	count
53	Number_of_Days_with_Blowing_Dust/Sand	count
54	Number_of_Days_with_Visibility_≤_Threshold*_km	count
55	Number_of_Days_with_No_Sunshine	count
56	Number_of_Days_with_Dew	count
57	Number_of_Days_with_Rime/Glaze_Ice	count
58	Number_of_Days_with_Air_Frost	count
59	Number_of_Days_with_Grass_Frost	count
60	Number_of_Days_with_Gale_Force_Winds	count
61	Number_of_Days_Maximum_Temperature_≤_threshold*_Deg_C	count
62	Number_of_Days_Minimum_Temperature_≥_threshold*_Deg_C	count

Parameter _Code	Parameter_Name	Units
63	Number_of_Days_with_Dust/Haze/Mist	count
64	Number_of_Days_Maximum_Temperature_>_threshold*_Deg_C	count
65	Number_of_Days_Maximum_Temperature_<_threshold*_Deg_C	count
66	Number_of_Days_Minimum_Temperature_>_threshold*_Deg_C	count
67	Number_of_Days_Minimum_Temperature_<_threshold*_Deg_C	count
68	Number_of_Days_with_Snowfall_≥_threshold*_cm	count
69	Number_of_Days_with_Freezing_Rain/Drizzle	count
70	Number_of_Days_with_Blowing_Snow	count
71	Number_of_Days_with_Rain/Drizzle	count
72	Number_of_Days_with_Snow/Hail	count
73	Number_of_Days_with_Fog/Mist	count
74	Number_of_Days_with_Ice_Storm	count
75	Number_of_Days_with_Thick_Haze	count
76	Number_of_Days_with_Rising_Sand	count
77	Number_of_Days_with_Mist	count
78	Number_of_Days_with_Squalls	count
79	Number_of_Days_with_Duststorm/Sandstorm	count
80	Number_of_Days_with_Sleet/Snow	count
81	Number_of_Days_with_Fog	count
82	Number_of_Days_with_Daily_Max_Wind_Speed_≥_threshold*_m/s	count
99	Custom_Element_Specified_by_Contributor	custom
*For parameters with the word "threshold" specify a numerical value or qualifier, repeat as needed.		

3. EXCEL SUBMISSION FOR EACH STATION RECORD

The EXCEL approach for the collection of Climatological Standard Normals is designed to be very simple to use and is compatible to most versions of EXCEL ([Attachment I](#)). Each climatological surface parameter is available in the Parameter tab of the Template workbook. The template has the headers pre-defined for the principal climatological surface parameters and secondary parameters, but for other parameters the three fields in the Parameter tab (Parameter_Code, Parameter_Name, and Units) can be copied and pasted into blank header sections to be included in the submission. When including data in the section below the header, the station's WMO_Number and the Parameter_Code are the first two items in a data row, followed by the Calculation_Name and Calculation_Code for the parameter that can be copied and pasted from the Calculation Method tab. The monthly and annual (if available) data values then populate the remainder of the row. An example tab shows a station submission with multiple parameters already entered.

As shown in [Attachment I](#), each parameter included in a submission has an individual header and data table.

Cabezal:

Column A: Parameter_Code

Column B: Parameter_Name

Column C: Units

Dato:

Column A: WMO_Number

Column B: Parameter_Code

Column C: Calculation_Name

Column D: Calculation_Code

Columns E-P: January-December Normals Data

Column Q: Annual Normals Data

Further important notes including lessons learnt from 1981–2010 CLINO collection:

- If a value is missing, then leave the field blank.
- All values should be right-justified.
- Decimal points are represented as dots "." (11.1, 1014.0, -14.2).
- If the temperature is negative, the first value of the field should be "-" (e.g. -13.0).
- If precipitation is zero, the field should be "0.0". Trace should be coded as "0.0".
- Using the EXCEL format, a country can submit files individually for each station, or using a single EXCEL file for all stations, placing each station in a separate spreadsheet tab.
- For single station files, construct file names as: StationName_Number.xls with no spaces or special characters (example: Asheville_72315.xlsx). The last five digits of WIGOS numbers or the WMO numbers are acceptable; if there is no station WMO or WIGOS number, inclusion of a local country station number is optional (maximum five digits). Leading with the station name will be best for listing files on access systems.
- For files with multiple stations, do not put multiple stations in a single table. Each station should have its own tab, with the name of each tab constructed as: StationName_Number with no spaces or special characters (example: Asheville_72315.xlsx). WIGOS numbers (last five digits) or the WMO numbers are acceptable; if there is no station WMO or WIGOS number, local station numbers can be used (maximum five digits). The file should not be compressed if less than 10 MB. The file name should be CountryName_WMO_Normals_9120.xls with no spaces (example: UnitedStates_WMO_Normals_9120.xlsx).
- If a folder of files is transmitted in a compressed fashion, it should be compressed and zipped in a standard manner compatible with Windows. The file name should be CountryName_WMO_Normals_9120.zip with no spaces (example: UnitedStates_WMO_Normals_9120.zip).

4. ASCII SUBMISSION IN COMMA SEPARATED VALUES FORMAT (*.CSV)

In the previous Normals collection in the 1990s, ASCII submissions were allowed in a variety of formats using a number of delimiters (blanks, multiple blanks, tabs, etc.). The current collection will reduce these possibilities to one, the use of Comma Separated Values format (*.csv). One of the key attributes of this approach is that vertical alignment of data columns will not be required (as is needed in space and tab delimited files) as long as commas are separating both existing and missing values. Files constructed like the [Attachment II](#) example will easily import into EXCEL, so that the final formatted version made available for all Climatological Standard Normals will all be uniform. The same relative positional formatting will be followed as in the EXCEL case, except the values will be in an ASCII text file with comma separate values.

Further important notes including lessons learnt from 1981–2010 CLINO collection:

- Missing values are represented with blanks only, no numerical or alphabetical codes.
- Decimal points are represented as dots "." (11.1, 1014.0, -14.2).
- If the temperature is negative, the first value of the field should be "-" (e.g. -13.0).
- If precipitation is zero, the field should be "0.0". Trace should be coded as "0.0".
- Each *.csv station file should be for only one station.
- If a folder of files is transmitted in a compressed fashion, it should be compressed and zipped in a standard manner compatible with Windows. The file name should be CountryName_WMO_Normals_9120.zip with no spaces (example: UnitedStates_WMO_Normals_9120.zip).
- File names should be constructed as: StationName_Number.csv with no spaces or special characters (example: Asheville_72315.csv). WIGOS numbers (last five digits) or the WMO numbers are acceptable; if there is no station WMO or WIGOS number, inclusion of a local country station number is optional (maximum five digits). Leading with the place name will be best for listing files on access systems.

5. SUBMISSION OF EXPLANATORY NOTES

Explanatory notes are strongly encouraged to be provided with the data submission in open text format (WORD document or TEXT file; file name: CountryName_WMO_Normals_9120_Additional.doc), ideally using one of the WMO languages. Explanatory notes document information necessary to correctly interpret Climatological Standard Normals submitted. Examples for Explanatory notes include information on homogeneity of underlying time series, use of data estimation methods to fill data gaps in underlying time series, observing time constraints, implications of station automation, less than 30 years of observations, formula used for vapour pressure calculation etc.

REFERENCES

- World Meteorological Organization, 1996: Climatological Normals (CLINO) for the Period 1961–1990 (WMO-No. 847). Geneva
- World Meteorological Organization, 2015: *Seventeenth World Meteorological Congress* (WMO-No. 1157). Geneva.
- World Meteorological Organization, 2017: *WMO Guidelines on the Calculation of Climate Normals* (WMO-No. 1203). Geneva.

ATTACHMENT I: EXAMPLE EXCEL FILE (SINGLE STATION PER TAB)

This example table shows a subset of the EXCEL Climatological Standard Normals spreadsheet for a station. The complete header is included, followed by headers and data fields for three of the eight principal element parameter combinations. The table subset ends on the right to the column for March, but in the template there are columns not shown to the right completing the twelve months and also providing a column for an annual value. Note the use of vertical bar characters to separate the latitude and longitude degrees, minutes, seconds, and direction so they will stay together if exported from the EXCEL file. The EXCEL template is available at <https://www.ncei.noaa.gov/pub/data/normals/WMO/>.

World Meteorological Organization Climate Normals for 1991-2020						
Single Station Data Sheet For All Climatological Surface Parameters						
Station Header Record						
Country Name	UNITED STATES OF AMERICA					
Station Name	FAIRBANKS INTL					
WMO Number	Latitude	Longitude	Station Height			
70261	64 49 00 N	147 52 00 W	133			
WMO Integrated Global Observing System (WIGOS) Station Identifier (if available)						
0-20000-0-70261						
Principal Climatological Surface Parameters						
Parameter Code	Parameter Name	Units				
1	Precipitation Total	mm				
WMO Number	Parameter Code	Calculation Name	Calculation Code	January	February	March
70261	1	Sum	4	11.9	10.2	9.4
70261	1	NOY	98	30.0	30.0	30.0
Parameter Code	Parameter Name	Units				
2	Number of Days with Precipitation >= 1 mm	count				
WMO Number	Parameter Code	Calculation Name	Calculation Code	January	February	March
70261	2	Count	5	3.8	2.8	3.0
70261	2	NOY	98	30.0	30.0	30.0
Parameter Code	Parameter Name	Units				
3	Daily Maximum Temperature	Deg C				
WMO Number	Parameter Code	Calculation Name	Calculation Code	January	February	March
70261	3	Mean	1	-18.7	-13.8	-4.6
70261	3	NOY	98	30.0	30.0	30.0

ATTACHMENT II: EXAMPLE ASCII FILE IN *.CSV FORMAT (SINGLE STATION PER FILE)

This example table shows a subset of an ASCII *.csv format Climatological Standard Normals file for a station. The complete header is included, followed by headers and data fields for three of the eight principal climatological surface parameters. The table subset shows entire parameter records for all months and the annual value, but the month labels end on the right at March due to space limitations here; in the example file there are month labels to the right completing the twelve months and also providing a column for an annual value. Note the use of vertical bar characters to separate the latitude and longitude degrees, minutes, seconds, and direction so they will stay together if imported into an EXCEL spreadsheet. The csv template is available at <https://www.ncei.noaa.gov/pub/data/normals/WMO/>.

World Meteorological Organization Climate Normals for 1991-2020
Single Station Data Sheet For All Climatological Surface Parameters

Station Header Record

Country_Name,UNITED_STATES_OF_AMERICA
Station_Name,FAIRBANKS_INTL

WMO_Number,Latitude,Longitude,Station_Height
70261,64|49|00|N,147|52|00|W,133

WMO Integrated Global Observing System (WIGOS) Station Identifier (if available)
0-20000-0-70261

Principal Climatological Surface Parameters

Parameter_Code,Parameter_Name,Units
1,Precipitation_Total,mm

WMO_Number,Parameter_Code,Calculation_Name,Calculation_Code,January,February,March
70261,1,Sum,4,11.9,10.2,9.4
70261,1,NOY,98,30.0,30.0,30.0

Parameter_Code,Parameter_Name,Units
2,Number_of_Days_with_Precipitation_>=1_mm,count

WMO_Number,Parameter_Code,Calculation_Name,Calculation_Code,January,February,March
70261,2,Count,5,3.8,2.8,3.0
70261,2,NOY,98,30.0,30.0,30.0

Parameter_Code,Parameter_Name,Units
3,Daily_Maximum_Temperature,Deg_C

WMO_Number,Parameter_Code,Calculation_Name,Calculation_Code,January,February,March
70261,3,Mean,1,-18.7,-13.8,-4.6
70261,3,NOY,98,30.0,30.0,30.0