National Climatic Data Center

DATA DOCUMENTATION

FOR

DATA SET 9644 (DSI-9644)
WORLD WEATHER RECORDS

December 23, 2002

National Climatic Data Center
151 Patton Ave.
Asheville, NC 28801-5001 USA
# Table of Contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Abstract</td>
<td>3</td>
</tr>
<tr>
<td>2. Element Names and Definitions</td>
<td>4</td>
</tr>
<tr>
<td>3. Start Date</td>
<td>8</td>
</tr>
<tr>
<td>4. Stop Date</td>
<td>9</td>
</tr>
<tr>
<td>5. Coverage</td>
<td>9</td>
</tr>
<tr>
<td>6. How to order data</td>
<td>9</td>
</tr>
<tr>
<td>7. Archiving Data Center</td>
<td>9</td>
</tr>
<tr>
<td>8. Technical Contact</td>
<td>9</td>
</tr>
<tr>
<td>9. Known Uncorrected Problems</td>
<td>9</td>
</tr>
<tr>
<td>10. Quality Statement</td>
<td>9</td>
</tr>
<tr>
<td>11. Essential Companion Data Sets</td>
<td>10</td>
</tr>
<tr>
<td>12. References</td>
<td>10</td>
</tr>
<tr>
<td>Appendix A: World Meteorological Organization Instructions</td>
<td>11</td>
</tr>
</tbody>
</table>
1. **Abstract:** The data set has been collected under the name "World Weather Records" (WWR) since the first series was published in a single volume in 1927. The 1981-90 decadal series is the eighth series of published data. As of November 1996, only three of these series: 1951-60, 1961-70 and 1971-80 have been digitally archived in DSI-9644. Other data sets at the National Climatic Data Center (NCDC), most notably the Global Historical Climate Network (GHCN: DSI-9100) have historical surface climatological data derived from the earlier, non-digital series of WWR.

**Historical Perspective**

In 1923, the International Meteorological Conference Committee, convened in Utrecht, Netherlands offered initial justification for the creation of WWR:

"...the conference thinks that publication of long and homogeneous series of observations in the form of monthly means of pressure, temperature and rainfall would be of the highest importance for the study of the general circulation of the atmosphere."

In response to the Conference’s findings, the Smithsonian Institution of the United States sponsored the first series of WWR, edited by H. Helm Clayton and published in a single volume (1196 pages) in 1927. The publication included full period of record through 1920 of monthly means of temperature, pressure (station and sea-level) and precipitation for selected global stations. The volume was reprinted by the Smithsonian Institution (Smithsonian Miscellaneous Collections, Volume 79) in 1944.

The second series of WWR was published by the Smithsonian Institution (Smithsonian Miscellaneous Collections, Volume 90) as a single volume (646 pages) in 1934. This series covered the period 1921-30. In this series the precedent to include data back to the beginning of record for stations not previously published in WWR was established.

The third series of WWR was published by the Smithsonian Institution (Smithsonian Miscellaneous Collections, Volume 105) as a single volume (616 pages) in 1947. This series covered the period 1931-40.

In the fourth series of WWR, publication responsibility passed from the Smithsonian Institution to the U.S. Department of Commerce, Weather Bureau. Maintaining previous publication formats and elements, a single volume (World Weather Records, 1941-50; 1361 pages) was published by the Weather Bureau in Washington, DC in 1959.

In the fifth series, publication responsibility was tasked to the National Weather Records Center (predecessor of the NCDC) in Asheville, NC. This series marked the start of digital data archiving of WWR. In addition, the World Meteorological Organization (WMO) became involved, offering its sponsored collection of data included in the Weather Bureau’s Monthly Climatic Data of the World (MCDW; DSI-3500) as a source for the 1951-60 series. WMO sponsorship of WWR was formalized in 1963. In 1960, the WMO Commission for Climatology recommended that WWR data be published in six separate volumes. This recommendation was adopted by the Weather Bureau and the six volumes were published between 1965 and 1968. Upon completion, the entire 1951-60 series was archived as the initial input into data set DSI-9644.

The sixth series of WWR were published by the National Climatic Center (predecessor to the NCDC) in six separate volumes between 1979 and 1985. With: 3:
This series, one nation in each of the Regional Associations of the WMO was designated as a Regional Collector. The Regional Collector was responsible for collecting monthly pressure, temperature and precipitation data from nations within its region specifically for inclusion in WWR. This arrangement was agreed upon in 1973 by the WMO Commission for Special Applications of Meteorology and Climatology (CoSAMC). Upon completion, the entire 1961-70 series was added to DSI-9644.

The seventh series of WWR was published by the NCDC in six separate volumes between 1986 and 1994. Upon completion, the entire 1971-80 series was added to DSI-9644.

As of November, 1996, the eighth series of WWR was still being processed. Upon completion of each volume, that volume’s 1981-90 data will be appended to DSI-9644.

2. Element Names and Definitions:

World Weather Records are provided as published volumes and in DSI-9644, the ASCII-formatted digital database.

Beginning with the 1951-60 series, World Weather Records have been published by the National Climatic Data Center (and its predecessors) in a six-volume set, with each volume roughly corresponding to a continent (with the exception of Volume 6):

<table>
<thead>
<tr>
<th>Volume</th>
<th>Geographic Coverage</th>
<th>WMO Regional Associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>North America</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Europe</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>West Indies, Central and South America</td>
<td>3,4</td>
</tr>
<tr>
<td>4</td>
<td>Asia</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Africa</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Islands of the World</td>
<td>1-7</td>
</tr>
</tbody>
</table>

All available data are both published in the volume sets and digitally archived through NCDC’s tape library under DSI-9644. Elements from 1951-70 include monthly means of pressure (station and sea-level and temperature, as well as monthly total amounts of precipitation. Beginning with the 1981-90 series, values of mean maximum and minimum monthly temperatures were additionally included in DSI-9644. These temperature elements have not been published in the 1981-90 volume series, but their availability in DSI-9644 is indicated in each volume’s index. Data in DSI-9644 are available from 1951 through the most recent full decade, contingent upon data collection and processing efforts.

No access software is available, but a standard 3rd-generation computer language like FORTRAN, COBOL, or C can be used to access the ASCII digital database, which is maintained in NCDC’s tape library under DSI-9644.

Beginning with the 1961-70 series, the data are arranged in what is called the World Weather Records format, which is a ‘flat’, fixed-length ASCII sequential file. **ALL DSI-9644 DATA PRIOR TO THE 1961-70 SERIES ARE WRITTEN IN A FORMAT NOT COVERED BY THIS DOCUMENT.** (DOCUMENTATION IS AVAILABLE FOR THE EARLIER SERIES, BUT NOT IN DIGITAL FORM. PLEASE SEE THE TECHNICAL CONTACT IF YOU ARE INTERESTED.) The records are sorted first by COUNTRY and STATION DESIGNATOR...
grouping, then by RECORD DESIGNATOR and YEAR grouping (see definitions of these parameters below). There are separate header and data record formats, which are declared and arranged in the column format below:

Header records:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Width</th>
<th>Start Column</th>
<th>End Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Reserved)</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>WMO NUMBER</td>
<td>Integer</td>
<td>5</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>RECORD DESIGNATOR</td>
<td>Integer</td>
<td>1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>LATITUDE DEGREES</td>
<td>Integer</td>
<td>2</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>LATITUDE MINUTES</td>
<td>Integer</td>
<td>2</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>LATITUDE SYMBOL</td>
<td>Character</td>
<td>1</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>LONGITUDE DEGREES</td>
<td>Integer</td>
<td>3</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>LONGITUDE MINUTES</td>
<td>Integer</td>
<td>2</td>
<td>17</td>
<td>18</td>
</tr>
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<td>Character</td>
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<td>19</td>
<td>19</td>
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<td>20</td>
<td>43</td>
</tr>
<tr>
<td>STATION NAME</td>
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<td>24</td>
<td>44</td>
<td>67</td>
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<td>STATION HEIGHT</td>
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<td>5</td>
<td>68</td>
<td>72</td>
</tr>
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<td>BAROMETER HEIGHT</td>
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<td>6</td>
<td>73</td>
<td>78</td>
</tr>
<tr>
<td>(Reserved)</td>
<td></td>
<td>79</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>COUNTRY DESIGNATOR</td>
<td>Integer</td>
<td>4</td>
<td>81</td>
<td>84</td>
</tr>
<tr>
<td>STATION DESIGNATOR</td>
<td>Integer</td>
<td>5</td>
<td>85</td>
<td>89</td>
</tr>
</tbody>
</table>

Data records:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Width</th>
<th>Start Column</th>
<th>End Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Reserved)</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>WMO NUMBER</td>
<td>Integer</td>
<td>5</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>RECORD DESIGNATOR</td>
<td>Integer</td>
<td>1</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>YEAR OF DATA</td>
<td>Integer</td>
<td>4</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>AVERAGE DESIGNATOR</td>
<td>Integer</td>
<td>1</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>JANUARY DATA VALUE</td>
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<td>5</td>
<td>14</td>
<td>18</td>
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<td>24</td>
<td>28</td>
</tr>
<tr>
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<td>5</td>
<td>29</td>
<td>33</td>
</tr>
<tr>
<td>MAY DATA VALUE</td>
<td>Integer</td>
<td>5</td>
<td>34</td>
<td>38</td>
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<td>JUNE DATA VALUE</td>
<td>Integer</td>
<td>5</td>
<td>39</td>
<td>43</td>
</tr>
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<td>JULY DATA VALUE</td>
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<td>5</td>
<td>44</td>
<td>48</td>
</tr>
<tr>
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<td>Integer</td>
<td>5</td>
<td>49</td>
<td>53</td>
</tr>
<tr>
<td>SEPTEMBER DATA VALUE</td>
<td>Integer</td>
<td>5</td>
<td>54</td>
<td>58</td>
</tr>
<tr>
<td>OCTOBER DATA VALUE</td>
<td>Integer</td>
<td>5</td>
<td>59</td>
<td>63</td>
</tr>
<tr>
<td>NOVEMBER DATA VALUE</td>
<td>Integer</td>
<td>5</td>
<td>64</td>
<td>68</td>
</tr>
<tr>
<td>DECEMBER DATA VALUE</td>
<td>Integer</td>
<td>5</td>
<td>69</td>
<td>73</td>
</tr>
<tr>
<td>ANNUAL DATA VALUE</td>
<td>Integer</td>
<td>5</td>
<td>74</td>
<td>78</td>
</tr>
<tr>
<td>(Reserved)</td>
<td></td>
<td></td>
<td>79</td>
<td>80</td>
</tr>
<tr>
<td>COUNTRY DESIGNATOR</td>
<td>Integer</td>
<td>4</td>
<td>81</td>
<td>84</td>
</tr>
<tr>
<td>STATION DESIGNATOR</td>
<td>Integer</td>
<td>5</td>
<td>85</td>
<td>89</td>
</tr>
</tbody>
</table>

Note: Some data values may be blank-filled (missing). These values should be read as character data, i.e., 13(a5), rather than as integers, since a blank read as an integer has a value of zero. A description of each element follows.

**Header Records**

5:
**WMO NUMBER**

This element is a five-digit integer that identifies a station. The Secretariat of the World Meteorological Organization, Geneva, Switzerland assigns such numbers to stations that are internationally recognized surface and/or upper air meteorological stations that contribute data to national and/or international data sets. Because of constant changes to this network of weather reporting observing stations, the WMO publishes WMO Volume A: Weather Reporting Observing Stations every six months. This publication is the authority on all WMO Number assignments.

Not all stations in the World Weather Records, have valid WMO numbers. In some cases, the WMO number is missing and this field is left blank. In this situation, stations should be identified within the decadal series using the NCDC-assigned STATION DESIGNATOR (see section 4.2) in conjunction with the COUNTRY DESIGNATOR. Occasionally, the nations submitting data for WWR include stations (primarily newly opened stations) that have not been formally recognized by the WMO. For confirmation of valid WMO numbers, the user is referred to WMO Volume A.

According to WMO Volume A, the following ranges of WMO numbers are valid in the following WMO Regional Associations:

<table>
<thead>
<tr>
<th>Regional Association</th>
<th>Lowest Number</th>
<th>Highest Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>I: Africa</td>
<td>60000</td>
<td>69999</td>
</tr>
<tr>
<td>II: Asia</td>
<td>20000</td>
<td>20099</td>
</tr>
<tr>
<td></td>
<td>20200</td>
<td>21999</td>
</tr>
<tr>
<td></td>
<td>23000</td>
<td>25999</td>
</tr>
<tr>
<td></td>
<td>28000</td>
<td>32999</td>
</tr>
<tr>
<td></td>
<td>35000</td>
<td>36999</td>
</tr>
<tr>
<td></td>
<td>38000</td>
<td>38999</td>
</tr>
<tr>
<td></td>
<td>40350</td>
<td>48599</td>
</tr>
<tr>
<td></td>
<td>48800</td>
<td>49999</td>
</tr>
<tr>
<td></td>
<td>50000</td>
<td>59999</td>
</tr>
<tr>
<td>III: South America</td>
<td>80000</td>
<td>88999</td>
</tr>
<tr>
<td>IV: North and Central America</td>
<td>70000</td>
<td>79999</td>
</tr>
<tr>
<td>V: South-West Pacific</td>
<td>48600</td>
<td>48799</td>
</tr>
<tr>
<td></td>
<td>90000</td>
<td>98999</td>
</tr>
<tr>
<td>VI: Europe</td>
<td>00000</td>
<td>19999</td>
</tr>
<tr>
<td></td>
<td>20100</td>
<td>20199</td>
</tr>
<tr>
<td></td>
<td>22000</td>
<td>22999</td>
</tr>
<tr>
<td></td>
<td>26000</td>
<td>27999</td>
</tr>
<tr>
<td></td>
<td>33000</td>
<td>34999</td>
</tr>
<tr>
<td></td>
<td>37000</td>
<td>37999</td>
</tr>
<tr>
<td></td>
<td>40000</td>
<td>40349</td>
</tr>
<tr>
<td>Stations in the Antarctic</td>
<td>89000</td>
<td>89999</td>
</tr>
</tbody>
</table>

**RECORD DESIGNATOR**

This element is a one-digit integer that distinguishes between header and data.
records, and between the varying types of data records. It is always a '1' for header records, and one of the following for data records: '2' for mean station pressure (recorded in hPa); '3' for mean sea-level pressure (hPa); '4' for mean air temperature (recorded in degrees Celsius); '5' for total amount of precipitation (recorded in millimeters); '6' for mean of the daily maximum air temperature (°C); and '7' for mean of the daily minimum air temperature (°C).

LATITUDE DEGREES/MINUTES/SYMBOL

These three elements make up the latitudinal location of a station. Degrees is a two-digit integer, varying from 00 to 59. Minutes is a two-digit integer, varying from 00 to 59. Symbol is a one-character field that distinguishes Northern Hemisphere ("N") from Southern Hemisphere ("S") locations.

LONGITUDE DEGREES/MINUTES/SYMBOL

These three elements make up the longitudinal location of a station. Degrees is a three-digit integer, varying from 000 to 180. Minutes is a two-digit integer, varying from 00 to 59. Symbol is a one-character field that distinguishes locations west of the Prime Meridian ("W") from locations east of the Prime Meridian ("E").

COUNTRY NAME

This element is the WMO-accepted short-form name of a given nation, as described in WMO Volume A, up to 24 characters. Between decadal series, country names may change for political reasons. If a change is submitted by the successor political entity, it will be published as submitted even if the station was a part of a predecessor political entity during the decadal series in question.

STATION NAME

This element is, for WMO numbered stations, the name of the station as described in WMO Volume A. For other stations, the name of the station is determined by the submitting nation or other source. All names are anglicized and are not accented. The first 24 characters of the station name are retained in this element.

STATION HEIGHT

This element is a five-digit integer that gives the height of a station above mean sea level to the nearest meter. Some stations have station heights below mean sea level (e.g., Alexandria/Nouzha, Egypt is at -2 meters).

BAROMETER HEIGHT

This element is a six-digit integer that gives the height of the base a station's barometer above mean sea level to the nearest tenth of a meter. The tenths place is implied.

COUNTRY-STATION DESIGNATOR

: 7:
These two elements, four-digit and five-digit integers, respectively, group stations by country nations and distinguish between stations in the same country. Their assignment is made by the NCDC in order to sort and keep track of WMO-numbered and non-numbered stations within a given decadal series. The assignment of station designators is made so that they can be used to sort countries and stations alphabetically by volume. As a result, they do not adhere to Federal Information Processing Standard (FIPS) assignments. Because new stations and country changes can yield differences in these elements between decadal series, these elements should be used with caution for inter-decadal compilation of data.

Data records

WMO NUMBER See Header Records above

RECORD DESIGNATOR See Header Records above

YEAR OF DATA

This element is the four-digit calendar year (e.g., 1995).

AVERAGE DESIGNATOR

This element is a one-digit integer that distinguishes decadal means (value of '1') with thirty-year Climatological Normals (CLINO) (value of '2') or other long-term averages. Data associated with a specific year has a blank AVERAGE DESIGNATOR.

DATA VALUES (JANUARY–DECEMBER AND ANNUAL)

These thirteen elements are five-digit integers that provide the monthly means (or, for the thirteenth element a mean of the monthly means for temperature and pressure or total for precipitation) for a given year, decadal average, or CLINO or long-term average. Note that the annual value is not computed unless all months of data are present. Also note that decadal averages for a given month are not computed unless at least five months of data are present for that month in the given ten-year period. If the value is not computed, this field remains blank.

Published values of these elements for temperature and pressure include a decimal place, but in DSI-9644 values are provided in tenths with an implied decimal point. Thus, a pressure value of 10145 is really 1014.5, 9975 is really 997.5, and so forth.

The total amount of precipitation is provided solely in integer form. As a result, zero and trace values are distinguished (both in DSI-9644 and the volume sets) with a zero in the fourth column and a zero in both the fourth and fifth columns, respectively.

Blank values imply missing data.

COUNTRY DESIGNATOR See Header Records above

STATION DESIGNATOR See Header Records above

3. Start Date: 19510101. However, there are potentially a limited number of stations that were added to WWR in either the 1951–60, 1961–70 or 1971–80 period.
series that may have monthly data back to their beginning of record (which could precede January, 1951). If data is not received in time for publication in a decadal series, it is retained for publication in the next decadal series. Corrections are published as errata in the next decadal volume in which that country is included.

4. **Stop Date**: Ongoing. Current through the most recent full decade, contingent upon data collection and processing efforts.

5. **Coverage**: Global.
   
a. Southernmost Latitude: 90S  
b. Northernmost Latitude: 90N  
c. Westernmost Longitude: 180W  
d. Easternmost Longitude: 180E

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](mailto: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**: Data Extraction. When data is not provided by a nation in a timely fashion, the missing data is augmented from other sources (such as DSI-9100, DSI-3500 or other miscellaneous sources). When such sources are utilized a notation is made in the station notes section of the appropriate decadal volume. These alternative sources, to an extent, derive their data from the Global Telecommunications System (GTS). Unfortunately, transmission difficulties can result in an elevated number of missing months in the augmented data. This makes the separate, direct receipt of monthly data from WMO-member nations vital.

10. **Quality Statement**: This data set has undergone limited quality control. The quality control consists of:

    1. Station pressure check: values must always be less than or equal to sea-level pressure unless the barometer is below mean sea level.
    2. Static limits checks are applied to all values; values exceeding the
following thresholds are flagged as suspect and must be examined and corrected.

Pressure:  < 925 hPa or > 1050 hPa
Temperature:  < -40 °C or > 40 °C
Precipitation:  < 0 mm or > 3500 mm

3. If annual/decadal means are provided by the submitting country, they are compared against annual/decadal means calculated from the twelve monthly values provided. If the absolute value of the difference between these two values is more than 0.1, the value is flagged as suspect and must be examined and corrected.

4. Mean and CLINO values are examined for their compliance to period of record requirements. Mean values require at least five out of ten years for a decadal calculation and CLINO values require at least a thirty-year consecutive period of record.

11. **Essential Companion Datasets**: None. The data set published in DSI-9644 is, to varying degrees, documented by a nation’s submission of station notes. These notes are published in *World Weather Records* volumes.

12. **References**: No information provided with original documentation.

Appendix A, beginning on the next page, is a copy of the actual instructions issued by the WMO, used in the last data collection.
APPENDIX A: World Meteorological Organization Instructions

Our ref: M/WWR-I  GENEVA, 25 June 1996

Annex: 1

Subject: Collection of data from Region I for publication in World Weather Records 1981-1990

Action required: Submission of data to the appropriate regional coordinating centre as indicated below at the earliest convenience but not later than 31 December 1996

Dear Sir/Madam,

You will recall that data from Members of RA I were collected in 1988 for publication in the World Weather Records 1971-1980 series within the framework of a WMO-sponsored long-term project (reference WMO circular letter No. M/AF.CLW (AFR-505) of 26 February 1988). The volume containing these data, i.e. Volume 5 (Africa), was published and distributed by the National Climatic Data Center of the USA (NCDC) in 1993. I wish to take this opportunity to thank, on behalf of WMO, all Members which contributed to the project.

Arrangements have now been made for the preparation and publication of the World Weather Records 1981-1990 series following the procedure used for the preceding volumes in most WMO Regions, whereby a regional coordinating centre undertook to collect and edit the relevant data from the Members of the Regional Association for onward transmission to the NCDC for publication.

In Region I, in view of the large number of Members of RA I, the task of data collection is shared by two volunteering Members: Kenya and Senegal in such a way that Kenya, using the Regional Specialized Meteorological Centre (RSMC) in Nairobi, will collect the data from Members in Central, Eastern and Southern Africa, and Senegal will use the
RSMC in Dakar for collection from Members in Northern and Western Africa, as indicated below:

To: Permanent Representatives of Members of Regional Association I (AFR-

cc: President and vice-president of Regional Association I
    President and vice-president of CCl
    Permanent Representatives of Kenya and Senegal (for information)
    Director of the National Climatic Data Center of the USA

Dakar
Algeria
Benin
Burkina Faso
Cameroun
Cape Verde
Central African Republic
Chad
Congo
Côte d'Ivoire
Gabon
Gambia
Ghana
Guinea
Guinea-Bissau
Liberia
Libyan Arab Jamahiriya
Mali
Mauritania
Morocco
Niger
Nigeria
Portugal
Sao Tome and Principe
Senegal
Sierra Leone
Spain
Togo
Tunisia

: 12:
United Kingdom
Zaire

**Nairobi**
Angola
Botswana
Burundi
Comoros
Djibouti
Egypt
Eritrea
Ethiopia
France
Kenya
Lesotho
Madagascar
Malawi
Mauritius
Mozambique
Namibia
Rwanda
Seychelles
Somalia
South Africa
Sudan
Swaziland
Uganda
United Republic of Tanzania
Zambia
Zimbabwe
I therefore invite you to prepare the data from your country together with station notes, following the instructions formulated by NCDC and reproduced in the annex to this letter. These instructions constitute a revised and expanded version of those used in the 1961-1970 data collection. However, the formats and procedures to be used in presenting the data remain for the most part unchanged; the differences from the presentation of data relating to the 1961-1970 are summarized in the following points:

(a) The range of acceptable formats for transferring data has been expanded to include diskettes from CLICOM. If this system is used, the data are to be exchanged on ASCII diskettes using the standard CLICOM keying format for monthly data;

(b) Following a long-term need for enhancing the international climate record, the types of data to be exchanged have been expanded to include the mean daily maximum temperature for the month and the mean daily minimum temperature for the month (as defined in the Guide to Climatological Practices). These data will be included in the digital record as supplementary data and also used as a quality check of monthly mean temperature.

I should like to emphasize the need to take the utmost care in the preparation of the material, adhering strictly to the formats indicated and providing all the required information relating to the stations. The station notes are considered an essential part of the whole presentation and should be prepared concurrently with the data listings.

To facilitate the early publication of data from Africa in the World Weather Records 1981-1990 series, I should be grateful if you would send your contribution at your earliest convenience, but not later than 31 December 1996 to the appropriate co-ordinating centre. The addresses of the co-ordinating centres are given below:

Météorologie nationale
Ministère du Tourisme et des Transports Aériens
B.P. 8257

Kenya Meteorological Department
Attn. Mr Richard S. Masika
P.O. Box 30259
NAIROBI

14:
INSTRUCTIONS FOR PREPARATION OF STATION NOTES AND DATA TO BE PRINTED IN WORLD WEATHER RECORDS (WWR), 1981-1990

1. Station Notes

To permit making the greatest possible use of your climatic data, please provide notes for all stations sent. The notes should include the following:

(a) Historical record of location, elevation, and instrumentation;

(b) Times of the observations used in computing means and times when precipitation is measured;

(c) Formulas used in computing means;

(d) Height of the barometer above mean sea level and heights of the thermometer and rain gauge above ground;

(e) Period of record of Climatological Normal (CLINO) or other long-period average values.

A sample of Station Notes is included at the end of the text of these instructions.

2. Data

The data elements to be entered for the period 1981-1990 are monthly and annual means of station pressure, sea level pressure, temperature, maximum temperature and minimum temperature, and monthly and annual totals of precipitation. These data are needed for the stations published in previous issues of World Weather Records. Additional stations are welcome but for those please include data from the earliest record available through 1990.

Beginning with the 1981-1990 decade, the data element types have been expanded to include monthly means of maximum and minimum temperature. These data will be included in the digital record as supplementary data.
and also used as quality check of monthly mean temperature. Please include data from the earliest record available through 1990 for all stations for these additional data types.

3. **Formats**

Two basic formats may be used. These are (i) the standard format described in detail below, which has been used in the collection process for the 1961-1970 WWR series, and (ii) the CLICOM ASCII export format (exporting the data from CLICOM onto computer diskettes using ASCII format).

The standard WWR format layout for giving the data relating to one station is divided into two main parts. The first format (for the 1st record) provides for a detailed station identification record. The second format relates to the record of the data for one element (together with the station index number) and can be further sub-divided into three parts as follows:

- Ten records to contain the monthly and annual means or totals for the years 1981 to 1990 (one record for each year);
- One record to contain the decadal average for 1981-1990;
- One record to contain the CLINO or other long-period average, if such data are available.

Full descriptions of the first and second formats are given in sub-paragraphs (a) and (b), respectively, below:

**(a) First format**

This format can be broken down into the following fields:

(i) Field 1 (characters 1 and 2) is used for internal sort processes. The use of this field is optional and the content is usually blank;

(ii) Field 2 (characters 3 to 7) is the WMO station index number. It is composed of the block number (characters 3 and 4) and the station number (characters 5 to 7);

(iii) Field 3 (character 8) is a designator of record. This is always "1" for the identification record;

(iv) Field 4 (characters 9 to 19) contains the co-ordinates of the station. The latitude (characters 9 to 13, right justified) is given by four digits (two for degrees and two for minutes) and the letter N or S, as appropriate. The longitude (characters 14 to 19, right justified) is given by five digits (three for degrees and two for minutes) and the letter E or W, as appropriate;
(v) Field 5 (characters 20 to 43, left justified) is the country name in English;

(vi) Field 6 (characters 44 to 67, left justified) is the station name in English;

(vii) Field 7 (characters 68 to 72, right justified) is the height of the ground at the station above mean sea level in metres at the end of 1990. (If the ground at the station is below mean sea level, character 68 shall be "-" (minus));

(viii) Field 8 (characters 73 to 78, right justified) is the elevation of the station (i.e. the height of the barometer above mean sea level) in tenths of a metre, at the end of 1990. (If the barometer at the station is below mean sea level, character 73 shall be "-" (minus)).

Notes: (1) Characters 79 and 80 are not used.

(2) The additional characters 81 to 89 may be used by the regional co-ordinating centre to give a "WWR sort number" for sorting purposes only. This field is optional.

Please indicate in the Station Notes all changes (and the dates of these changes) that occurred in the period 1981-1990 in the WMO station index number, co-ordinates, names, and heights referred to in the first format.

(b) Second format

This format can be broken down into the following fields:

(i) Field 1 (characters 1 and 2) is used for internal sort processes. The use of this field is optional and the content is usually blank;

(ii) Field 2 (characters 3 to 7) is the WMO station index number. It is composed of the block number (characters 3 and 4) and the station number (characters 5 to 7);

(iii) Field 3 (character 8) is the element designator code. The following codes should be used:

"2" = Mean pressure at station in tenths of a hectopascal

"3" = Mean of the pressure reduced to mean sea-level in tenths of a hectopascal

"4" = Mean air temperature in tenths of a degree Celsius

"5" = Total amount of precipitation in tenths of a millimetre

"6" = Mean of the daily maximum air temperatures in tenths of a degree Celsius
"7" = Mean of the daily minimum air temperatures in tenths of a degree Celsius

(Detailed instructions for entering the data are given in sub-paragraph (vi) below);

(iv) Field 4 (characters 9 to 12) is the year (one of 1981 to 1990 or earlier for new stations) to which the data relate. (See also sub-paragraph (v) below;)

(v) Field 5 (character 13) is the designator of multi-year average values. The following codes are used:

- no entry or blank = yearly data (records 2-11)
- "1" = decadal average (record 12)
- "2" = CLINO or other long-period average (record 13)

Please indicate in the Stations Notes the time periods to which CLINO or other long-period averages relate. When "1" or "2" is used in the field, enter "1990" in field 4;

(vi) Field 6 (characters 14 to 78) is composed of 13 sub-fields (twelve monthly and one annual mean or total) as follows:

<table>
<thead>
<tr>
<th>Characters</th>
<th>14 to 18: Value for January</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;</td>
<td>19 to 23: &quot; &quot; February</td>
</tr>
<tr>
<td>&quot;</td>
<td>24 to 28: &quot; &quot; March</td>
</tr>
<tr>
<td>&quot;</td>
<td>29 to 33: &quot; &quot; April</td>
</tr>
<tr>
<td>&quot;</td>
<td>34 to 38: &quot; &quot; May</td>
</tr>
<tr>
<td>&quot;</td>
<td>39 to 43: &quot; &quot; June</td>
</tr>
<tr>
<td>&quot;</td>
<td>44 to 48: &quot; &quot; July</td>
</tr>
<tr>
<td>&quot;</td>
<td>49 to 53: &quot; &quot; August</td>
</tr>
<tr>
<td>&quot;</td>
<td>54 to 58: &quot; &quot; September</td>
</tr>
<tr>
<td>&quot;</td>
<td>59 to 63: &quot; &quot; October</td>
</tr>
<tr>
<td>&quot;</td>
<td>64 to 68: &quot; &quot; November</td>
</tr>
<tr>
<td>&quot;</td>
<td>69 to 73: &quot; &quot; December</td>
</tr>
<tr>
<td>&quot;</td>
<td>74 to 78: &quot; &quot; year</td>
</tr>
</tbody>
</table>

The following rules apply for field 6:

1. The values shall be given in the unit indicated in sub-paragraph (b) (iii) above and shall be right justified within each sub-field. If the tenth figure of a value is not available, the corresponding character shall be coded "0" (zero). Decimal points are implied (i.e., 1014.1 is entered 10141).

2. If the mean temperature is negative, the first character of the corresponding sub-field shall be coded "-" (minus).

3. If the total amount of precipitation is zero, the fourth character of the corresponding sub-field shall be coded "0" (zero). If the total amount of precipitation is "trace"
(i.e. greater than zero but smaller than one-half tenth of a millimetre), the fourth and the fifth character of the corresponding field shall be coded "00" (double zero).

(4) If a monthly or yearly value is missing, the corresponding sub-field should be left blank.

Note: Concerning the use of characters 79 to 89, see Notes (1) and (2) in paragraph 3 (a) above.

If data are missing for an entire year, fields 1-5 should be encoded, (as well as characters 81 to 89, by the regional co-ordinating centre, if applicable), with field 6 left blank.

Samples of the WWR formats (with headings and notes in English only) are attached to these instructions.

Note: For practical reasons, the samples used in the preceding decade (filled in with data for the decade 1961-1970 from one station) have been reproduced. These samples contain references to punch cards and related operations, which should now be disregarded.

4. Media for providing the data

(a) Due to limited funds for this project, the most preferred data carrier is magnetic tape or ASCII diskettes. The data can also be forwarded in the form of lists.

(b) If a magnetic tape is used, it must be COBOL compatible and the following conditions must be observed:

- Density 800, 1600, or 6250 BPI
- Mode EBCDIC or ASCII
- Blocking 89/890*
- Number of tracks 9
- Parity Odd
- Labeling None

* Blocked 10 records per block.

Note: Tape will contain no tape marks except two END OF FILEs (EOF's) at the end of the data on each tape.

5. Sending of the data

The Members of RA I should send WWR data and Station Notes to the appropriate co-ordinating centre as indicated in the circular letter, not later than 31 December 1996.

Sample of Station Notes

: 
: 
: 19:
TRINIDAD AND TOBAGO (2 stations)

General:

All observation hours were in local time. A total of 24 hourly observations per day were used in computing the means of temperature and pressure except at Crown Point. At this station, part time operation existed during June to December 1980; January 1976; 1977, and 1978; February, March, April 1976; and for February, March, and April 1978. Observation hours during these periods were 0700 to 2300 hours or 0800 to 2200 hours.

At Piarco, the period of record of CLINO values for sea level pressure and temperature was 1946-1975. For precipitation it was 1946-1980. No CLINO exists for Crown Point since past records begin only in 1970.

Pressure:

Pressure was measured by a Kew Pattern barometer until 1974 after which a precision Aneroid type was used. Heights of the barometers were 13.4 meters at Piarco and 6.7 meters at Crown Point.

Temperature:

Thermometers, housed in a standard Stevenson Screen, were 1.2 meters above ground at both stations.

Precipitation:

Rainfall was measured by a pot gauge. A Tilting - Siphon rain recorder adjusted the pot gauge. Rainfall was measured four times daily at 0200, 0800, 1400, and 2000 hours local time at both stations except during part time operations at Crown Point. Heights of the rain gauges were .3 meters at Piarco, and 3 meters at Crown Point.

URUGUAY (13 stations)

General:

CLINO values correspond to the period 1951-80 for precipitation and 1946-1980 for other elements. Rain gauges and thermometers were located 1.5 meters above the ground.

Pressure and Temperature:

The monthly pressure and temperature values were both computed from the equation:

\[ P = 101325 \left(1 - 0.00654 \times T \right) \]

\[ T = 15 \]
Precipitation:

The daily values were measured at 0900 hours GMT.

NORTH AMERICA

TORONTO, ONT.                CANADA

WMO Number: 71266         Latitude: 43 ° 40 ′ N                Longitude: 079 ° 24 ′ W         Elevation:   113 meters

Station Pressure (in millibars)

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<tr>
<th>Year</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>MEAN</th>
</tr>
</thead>
<tbody>
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Temperature (in degrees Celsius)

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<th>Year</th>
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<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
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<th>Jul</th>
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**ALPHABETICAL INDEX - ALL STATIONS OR ELEMENTS**

**CODE OF DATA PUBLISHED AND IN DIGITAL DATABASE**

P: Pressure at Station Level  
T: Temperature  
M: Pressure at Sea Level  
R: Precipitation

**CODE OF DATA AVAILABLE ONLY IN DIGITAL DATABASE**

X: Mean Maximum Temperature  
N: Mean Minimum Temperature

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