

Historical Climatology Series

The Historical Climatology Series (HCS) is a set of climate-related publications published by NOAA's National Climatic Data Center beginning in 1978. HCS is comprised of six series which roughly follow themes. Series 1: Long term weather records; Series 2: Inventories; Series 3: Temperature and Precipitation Departures, Drought Indices; Series 4: Normals, weighted by area; 5: Normals, weighted by population; and 6: Climate Averages and Tropical Cyclones. Many issues in series 4 through 6 have been updated to include more recent data.

Series 1:

Historical Climatology Series, 1-1 Cooperstown NY, 1-2 Yellowstone WY, and 1-3 Southeastern IA are historical publications archived at the National Climatic Data Center. These stations have long records of collection and are located in distinctly rural areas. The records are as serially complete as possible. The period of record differs for each area: Cooperstown is from 1854-1977; Yellowstone is from 1887-1977; Southeastern Iowa is from 1839-1979. Major parameters include monthly and annual mean temperature, mean minimum and maximum temperature, total precipitation and snowfall, and dates of last freeze in spring and first freeze in the fall.

Series 2:

Historical Climatology Series 2.1-2.3 is a set of historical publications archived at the National Climatic Data Center (NCDC). This is Historical Climatology Series 2 of 6 that are published by the NCDC. This historical index publication contains information about the availability of specific records of meteorological/climatological data. The information can be from either published or unpublished sources in a large variety of forms, such as: serial or occasional published reports, manuscript records, autographic records, microfilm or microfiche, and digital records on file. Each publication gives the potential data user a comprehensive overview of the contents of those particular data sets of interest which are available from the NCDC and, occasionally, from other organizations which archive climatological data. Historical Climatological Series 2 is described below.

2-1 Index of Historical Surface Weather Records, New York (August 1978). Surface weather records from observation sites in the state of New York from the early 1800's through 1980 are summarized in this index. Included in the publication is a synthesis of station histories and other sources of documentation from various published and unpublished sources which are on file at the NCDC. Specifically given are: maps showing observation site location on a decadal basis, and index of station records with encoded instrument, archive, and publication data, an index of long period records (80 or more years of record), and an inventory of digitized data for 22 selected observation sites from the earliest recorded observation years through 1930. Also included is information excerpted from the climatic summary of the United States, 1930 edition, and New York summary because of its relevance to the history of weather observations in New York.

2-2 A History of Sunshine Data in the United States, 1891-1980 (July 1981). The NCDC has digitized and summarized monthly and annual totals of duration of sunshine from 239 observation sites for each available month and year of record for the period 1891-1984 in DSI-9788. This publication gives the historical background of the sunshine recording

network, periods of record for each recording site, information on the types of locations of instruments, and formats for various sources of published data. The sunshine data set inventory is given in graphical format by state/station. Map presentation show the sunshine station network as it existed in the years 1891, 1900, 1920, 1940, 1960, and 1980, along with other information on station locations. Examples of time series of annual sunshine data and a discussion on data interpretation are included as information which is generally helpful to the user of the sunshine data. Also given is a table of total possible sunshine in hours and tenths for the sunshine station network which was in operation during 1979.

2-3 Inventory of Sources of Long Term Climatic Data in Microfilm and Publication Form (July 1982). This inventory was designed to serve as a guide for users of 19th century climatic data, but includes references to 18th and 20th century data sets which are extensions of the data sets of principal interest. The data sources are primarily in manuscript, tabular, or graphical format, either a published hard copy or microform. The microform materials include microfilm copies of climatological record books, journals, and diaries, with the very early diaries and journals being in no particular format. A major portion of this inventory of sources of long term climatic data refers to sources which have been identified by the Climatic Research Unit of the School of Environmental Sciences, University of East Anglia at Norwich, United Kingdom.

Series 3:

Historical Climatology Series 3.1-3.16 are a set of historical publications archived at the National Climatic Data Center (NCDC). This is Historical Climatology Series 3 of 6 that is published by the National Climatic Data Center. The preface of each publication in this Historical Climatology Series provides a narrative description of the analytical techniques utilized to prepare the charts. Each publication contains analyzed isopleth charts which correspond to the title. Charts which depict the area distribution of climatic elements or parameters are often used in studies of climate variability. The atlases in the Historical Climatology Series (HCS) 3- (1 to 11) are designed to provide maps of climatological parameters which show climatic fluctuations in a relatively long-term or historical context. The coverage of the analyses can be on a local, regional, or continental scale. HCS 3 (12-15) are season-based departures from normal precipitation. HCS-16 continues the precipitation theme of HCS Series 3 by publishing the probability and amount of precipitation required for drought relief. Each publication is described below.

3-1 Atlas of Mean Winter Temperature Departures from the Long-Term Mean Over the Contiguous United States, 1895-1983. This atlas presents seasonal maps of departures of mean winter (December, January, February) temperatures over the contiguous United States for each of the 89 seasons in this period. The maps also present a statistical measure of the degree of unusualness of the departures by giving standardized departures (seasonal values minus the long-term mean divided by the standard deviation).

3-2, Winter (December-February); 3-3, Spring (March-May); 3-4, Summer (June-August); 3-5, Fall (September-November). This four-volume atlas presents maps of departures from long-term (1895-1983) statewide average monthly and seasonal temperatures, by year, for the contiguous United States. The departures are standardized, and are shown by one of five well-defined categories. The maps are arranged by year and serve to illustrate the degree of unusualness of any given season over the contiguous United States, as well as the variability which can occur between months within a season. Statewide average temperatures used in calculating departures for this atlas were derived

from weighted climatic division averages for the period 1931-1983. For 1895-1930, they consist of equally-weighted temperatures from all available reporting stations within a state. Several adjustments to the data from 1895-1930 were made in order to make the entire series (1895-1983) representative of the statewide averages as though calculated from climatic divisional data. For each season and each month, five categories of temperature departure from the 1895-1983 mean are indicated for each state by various types of shading. The five quantitatively- defined categories are qualitatively referred to as much above normal, above normal, normal, below normal, and much below normal.

3-6, Atlas of Monthly Palmer Hydrological Drought Indices (1895-1930) for the Contiguous United States (February 1985); 3-7, Atlas of Monthly Palmer Hydrological Drought Indices (1931-1983) for the Contiguous United States (February 1985). The Palmer Hydrological Drought Index is an objective measure of moisture conditions, applicable to the United States. It is a quantitative indicator of water availability (i.e., soil moisture, stream flow, and lake levels), and is strongly dependent on slow response water storage parameters. This pair of atlases contains maps of the index on a monthly basis which serve to illustrate the spatial and temporal variability of hydrological drought in the contiguous United States. Even categories of drought are delineated by various thresholds of drought and wetness;

3-8, Atlas of Monthly Palmer Moisture Anomaly Indices (1895-1930) for the Contiguous United States (February 1985); 3-9, Atlas of Monthly Palmer Moisture Anomaly Indices (1931-1984) for the Contiguous United States (February 1985). These atlases depict distributions of monthly values of the Palmer Moisture Anomaly (z) Index. The value of z is regarded as the Moisture Anomaly Index, and expresses on a monthly basis (from a moisture standpoint) the departure of the weather of a particular month from the average moisture climate of that month. Z values reflect short- term moisture deficiencies or excesses, and the index is quite sensitive to unusually wet (dry) months even in an extended period of dry (wet) weather;

3-10 Atlas of Monthly Palmer Drought Severity Indices (1895-1930) for the Contiguous United States (February 1985); 3-11 Atlas of Monthly Palmer Drought Severity Indices (1931-1983) for the Contiguous United States (February 1985); 3-12 Atlas of Monthly and Seasonal Precipitation Departures for the Contiguous United States - Winter; 3-13 Atlas of Monthly and Seasonal Precipitation Departures for the Contiguous United States - Spring; 3-14 Atlas of Monthly and Seasonal Precipitation Departures for the Contiguous United States - Summer; 3-15 Atlas of Monthly and Seasonal Precipitation Departures for the Contiguous United States - Fall. The Palmer Drought Severity Index, in contrast to the Palmer Hydrological Drought Index, is a meteorological drought index which attempts to classify spells of weather, this means that once the weather begins to change to a new regime, the index will rapidly respond, regardless of soil moisture conditions, stream flow, or lake levels, etc. The index is not very dependent on water storage parameters during wet/dry transition periods, as is the hydrological drought index. As a meteorological drought index, it has been used in meteorological and climatological studies where the classification of spells of wet or dry weather was important.

3-16 Probabilities and Precipitation Required to End or Ameliorate Droughts (June 1986). This atlas provides users of the Palmer drought index some quantitative measure of the precipitation required to end or ameliorate drought.

Series 4

HCS 4 and 5 is a subseries in a larger series of the U.S. Climate Normals for 1971-2000. HCS 4-1 is state, regional and national monthly and annual temperatures, weighted by area, for the normals period 1971-2000, plus earlier thirty-year normals periods starting in 1931. HCS 4-2 is similar to HCS 4-1, except it is for precipitation. HCS 4-3 is similar to HCS 4-1 and 4-2, except it is state, regional and national seasonal temperatures and precipitation. HCS 4-5 is a time series of regional season averages of various temperature readings.

HCS 4-6 and HCS 4-7: The Climate Variations Bulletin was a preliminary report that put current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center. The Bulletin was issued from 1989-1999. During 1990 the publication evolved from HCS 4-6 to 4-7 and, and was known as the Historical Climate Perspectives Bulletin in its first two years of publication.

Series 5:

HCS 5-1 is state, regional, and national heating degree days (base 65 Deg F), weighted by population. HCS 5-2 is similar to HCS 5-1, except it is for cooling degree days. HCS 5-3 describes heating degree days for states, regions and nationally, monthly and seasonally weighted by population. HCS 5-4 is similar to HCS 5-3, except it is for cooling degree days.

NOTE: HCS 4-1, 4-2, 4-3, 5-1 and 5-2 are archived digitally as NCEI DSI-9641E: Monthly Normal Temp Precip & Degree Days

Series 6:

HCS 6-1 summarizes the average climate of each U.S. state from the beginning of routine records in the late 1880s-early 1890s through 1982, in one issue per state. The first edition of HCS 6-2, *Topical Cyclones of the North Atlantic*, contained storms from 1871-1992. The second edition extended the period through 1998, and the third edition contained storms from 1851-2006. HCS 6-3, *Climatic Averages and Extremes for U.S. Cities*, was also updated, beginning with the period 1895-1991 with a second edition extending the period to 1995. HCS 6-4, *Climates of the World*, discusses the principal feature of all the continents and includes maps of worldwide temperatures and precipitation. Tables of monthly and annual temperatures and precipitation, including extremes, are included for approximately 800 world cities. Three editions were published, in 1969, 1972, and 1991. Finally, HCS 6-5 complements HCS 6-2, with charts of *Tropical Cyclones of the Eastern North Pacific* from 1949-2006.

Full Listing of Historical Climatology Series Publications

| HCS | Title | Published |
|------|--|---------------|
| 1-1 | A Long Record of Weather Observations at Cooperstown, New York 1854-1977 | July 1978 |
| 1-2 | Ninety-one Years of Weather Records at Yellowstone National Park, Wyoming - 1887-1977 | March 1979 |
| 1-3 | A Long Record of Weather Observations in Southeastern Iowa 1839-1979 | July 1980 |
| 2-1 | Index of Historical Surface Weather Records, New York | |
| 2-2 | A History of Sunshine Data in the United States 1891-1980 | July 1981 |
| 2-3 | Inventory of Sources of Long Term Climatic Data in Microfilm and Publication Form | July 1982 |
| 3-1 | Atlas of Mean Winter Temperature Departures from the Long-Term Mean Over the Contiguous United States, 1895-1983 | |
| 3-2 | Atlas of Monthly and Seasonal Temperature Departures from the Long-Term Mean (1895-1983) for the Contiguous United States - Winter | May 1984 |
| 3-3 | Atlas of Monthly and Seasonal Temperature Departures from the Long-Term Mean (1895-1983) for the Contiguous United States - Spring | May 1984 |
| 3-4 | Atlas of Monthly and Seasonal Temperature Departures from the Long-Term Mean (1895-1983) for the Contiguous United States - Summer | May 1984 |
| 3-5 | Atlas of Monthly and Seasonal Temperature Departures from the Long-Term Mean (1895-1983) for the Contiguous United States - Fall | May 1984 |
| 3-6 | Atlas of Monthly Palmer Hydrological Drought Indices (1895-1930) for the Contiguous United States | February 1985 |
| 3-7 | Atlas of Monthly Palmer Hydrological Drought Indices (1931-1983) for the Contiguous United States | February 1985 |
| 3-8 | Atlas of Monthly Palmer Moisture Anomaly Indices (1895-1930) for the Contiguous United States | July 1985 |
| 3-9 | Atlas of Monthly Palmer Moisture Anomaly Indices (1931-1984) for the Contiguous United States | July 1985 |
| 3-10 | Atlas of Monthly Palmer Drought Severity Indices (1895-1930) for the Contiguous United States | February 1985 |
| 3-11 | Atlas of Monthly Palmer Drought Severity Indices (1931-1983) for the Contiguous United States February 1985 | |
| 3-12 | Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1985) for the Contiguous United States - Winter | March 1986 |
| 3-13 | Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1985) for the Contiguous United States - Spring | March 1986 |
| 3-14 | Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1985) for the Contiguous United States - Summer | March 1986 |
| 3-15 | Atlas of Monthly and Seasonal Precipitation Departures from Normal (1895-1984) for the Contiguous United States - Fall | March 1986 |
| 3-16 | Probabilities and Precipitation Required to End or Ameliorate Droughts | June 1986 |

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|-----|--|----------------|
| 4-1 | State, Regional, and National Monthly and Annual Temperature Weighted by Area for the United States - January 1931-December 1991 | July 1993 |
| 4-2 | State, Regional, and National Monthly and Annual Precipitation Weighted by Area for the United States - January 1931-December 1991 | July 1993 |
| 4-3 | State, Regional, and National Monthly and Annual Temperature Weighted by Area for the United States - 1895-1993 | |
| 4-4 | (Not found anywhere) | |
| 4-5 | Time Series of Regional Season Averages of Maximum, Minimum, and Average Temperature, and Diurnal Temperature Range Across the United States: 1901-1987 | October 1989 |
| 4-5 | Time Series of Regional Season Averages of Maximum, Minimum, and Average Temperature, and Diurnal Temperature Range Across the United States: 1901-1987 | June 1989 |
| 4-6 | Historical Climate Perspectives Bulletin | July 1990 |
| 4-7 | Climate Variations Bulletin | |
| 5-1 | State, Regional, and National Monthly and Seasonal Heating Degree Days Weighted by Population (1990 Census) July 1931 - June 1992 | July 1993 |
| 5-2 | Monthly State, Regional and National Cooling Degree Days Weighted by Population January 1991 - January 1992 | June 1992 |
| 5-2 | State, Regional, and National Monthly and Annual Cooling Degree Days Weighted by Population (1990 Census) January 1931 - December 1991 | July 1993 |
| 5-3 | Percent of Normal - State, Regional, and National Monthly and Seasonal Heating Degree Days Weighted by Population (1980 Census) July 1931 - June 1983 | July 1984 |
| 5-4 | Percent of Normal - State, Regional, and National Monthly and Seasonal Cooling Degree Days Weighted by Population (1980 Census) January 1931 - December 1982 | July 1984 |
| 6-1 | Statewide Average Climatic History (By State, through 1982) | September 1983 |
| 6-2 | Tropical Cyclones of the North Atlantic 1871-1998 | |
| 6-2 | Tropical Cyclones of the North Atlantic 1871-1992 | |
| 6-2 | Tropical Cyclones of the North Atlantic 1851-2006 | |
| 6-3 | Climatic Averages and Extremes for U.S. Cities 1895-1991 | |
| 6-3 | Climatic Averages and Extremes for U.S. Cities 1895-1995 | |
| 6-4 | Climates of the World | |
| 6-5 | Tropical Cyclones of the Eastern North Pacific 1949-2006 | June 2009 |