WEATHER BUREAU
Office of Hydrology
Washington, D.C.
August 1968

Annotated Bibliography of ESSA Publications of Hydrometeorological Interest

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Technical Memorandum WBTM HYDRO 8

U.S. DEPARTMENT OF COMMERCE / ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION

WEATHER BUREAU TECHNICAL MEMORANDA

Office of Hydrology

The Office of Hydrology develops procedures for making river and water supply forecasts, analyzes hydrometeorological data for planning and design criteria for other agencies, and conducts pertinent research and development.

Weather Bureau Technical Memoranda in the Office of Hydrology series facilitate prompt distribution of scientific and technical material by staff members, cooperators, and contractors. Results presented in this series may be preliminary in nature and may be published formally elsewhere at a later date.

Memoranda listed below are available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Sills Bldg., 5285 Port Royal Road, Springfield, Va. 22151. Price: $3.00 hard copy; $0.65 microfiche. Order by accession number shown in parentheses at end of each entry.

TN 44 HYDRO 1 Infrared Radiation from Air to Underlying Surface. Vance A. Myers, May 1966. In former Weather Bureau Technical Notes series. (PB-170 664)

WBTM HYDRO 2 Annotated Bibliography of ESSA Publications of Hydrometeorological Interest. J. L. H. Paulhus, February 1967. (Superseded by WBTM HYDRO 8)

WBTM HYDRO 3 The Role of Persistence, Instability, and Moisture in the Intense Rainstorms in Eastern Colorado, June 14-17, 1965. F. K. Schwarz, February 1967. (PB-174 609)

WBTM HYDRO 4 Elements of River Forecasting. Marshall M. Richards and Joseph A. Strahl, October 1967. (PB-176 952)

WBTM HYDRO 5 Meteorological Estimation of Extreme Precipitation for Spillway Design Floods. Vance A. Myers, October 1967. (PB-177 687)

WBTM HYDRO 6 Annotated Bibliography of ESSA Publications of Hydrometeorological Interest. J. L. H. Paulhus, November 1967. (Superseded by WBTM HYDRO 8)

WBTM HYDRO 7 Meteorology of Major Storms in Western Colorado and Eastern Utah. Robert L. Weaver, January 1968. (PB-177 491)

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U.S. DEPARTMENT OF COMMERCE
Environmental Science Services Administration
Weather Bureau

Weather Bureau Technical Memorandum WBTM HYDRO 8

ANNOTATED BIBLIOGRAPHY OF ESSA PUBLICATIONS OF HYDROMETEOROLOGICAL INTEREST

J. L. H. Paulhus

OFFICE OF HYDROLOGY

WASHINGTON, D.C.
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ANNOTATED BIBLIOGRAPHY OF ESSA PUBLICATIONS

OF HYDROMETEOROLOGICAL INTEREST

Introduction

Many requests from engineers and others for hydrometeorological information indicate many are not aware that much of the information required is already available in published form. Bibliographies of government publications are issued periodically, but they cover publications in many fields of interest, and the selection of publications providing information in some particular field is often difficult.

This bibliography is especially intended to serve the engineer by bringing to his attention the publications of hydrometeorological material that he often requires. Some of the publications listed are included also in other indices covering meteorological or climatological subjects.

The bibliography, with a few exceptions, does not include periodicals such as the monthly and annual Climatological Data, which are all described in detail in "Selective Guide to Published Climatic Data Sources Prepared by U. S. Weather Bureau," Key to Meteorological Records Documentation No. 4.11, 1963 (see item 1.9, page 3). Other publications have been omitted because the procedures described or data presented have been rendered obsolete by more recent works, or because they are not available for distribution. A few out-of-print reports are listed because they are the only sources of some useful information. These publications are on the shelves of many libraries and may be available on a loan basis. Also, local Weather Bureau offices maintain a file of many of these publications for reference purposes.

Key to parenthetical identifiers

(GPO) Available from Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402 (Order by catalog number when given.)

(WB) Available from Chief, Hydrologic Services Division, Office of Hydrology, ESSA Weather Bureau, Silver Spring, Md. 20910

(X) Out of print -- not available for distribution

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1. CLIMATOLOGICAL OBSERVATIONS AND DATA

1.1 "Instructions for Climatological Observers," Weather Bureau Circular B, 11th ed., rev. 1962 (GPO...$0.50)

Describes (1) the standard Weather Bureau instruments for measuring temperature, precipitation and evaporation, (2) the exposure of the instruments, and (3) the procedures for making the measurements.

1.2 Local Climatological Data with Comparative Data (name of station and year), (GPO...$0.15)

Issued yearly for each of about 200 U. S. cities where Weather Bureau has first-order stations. Lists monthly precipitation and means of temperature, relative humidity and wind for the year of issue. Average temperature and total precipitation are tabulated for each month of record. Tables of normals, means and extremes of temperature, precipitation, relative humidity, wind and cloudiness for the period of record are also included. Also summarizes information on station locations, elevations, exposures, instrumentations from date station was established. (The 1962 issue contained only monthly data for that year.)

1.3 "Climatic Summary of the United States--Supplement for 1931 through 1952, (name of State)," Climatography of the United States No. 11, (GPO...$0.20 to $0.70; price list on pages 26 and 27.)

Lists monthly and annual precipitation, temperature, snowfall for each month and year. Also presents mean number of days with precipitation equal to or greater than 0.10 and 0.50 inch, mean evaporation, mean maximum and minimum daily temperatures, mean number of days with temperature greater than 90°F or less than 32°F.

1.4 "Climates of the States, (name of State)," Climatography of the United States No. 60, (GPO...$0.10 to $0.25; price list on pages 26 and 27.)

Presents a short description of the climate (about 6 pages) and series of tables and maps of normal, mean and extremes of precipitation, temperature, wind, relative humidity.

1.5 "Monthly Normals of Temperature, Precipitation and Heating Degree Days, (name of State)," Climatography of the United States No. 81, (GPO...$0.05)

Tabulations of station normals based on 1931-60 period.

1.6 "Summary of Hourly Observations, (name of City)," Climatography of the United States No. 82, (GPO...$0.10)

Presents total number of occurrences of precipitation, temperature, wind speed and direction, relative humidity and cloudiness for various classes of magnitude on an hourly, monthly and annual basis during the 10-year period, 1951-60. Summaries are available for about 300 key U. S. cities.

1.7 "Climatic Summary of the United States--Supplement for 1951 through 1960, (name of State)," Climatography of the United States No. 86, (GPO...$0.35 to $1.00; price list on pages 26 and 27.)

Same type of data as in 1.3 above.

1.8 Climatological Data, National Summary, (year), (GPO...$0.40)

Presents summaries of river and flood conditions; basic climatological data for the year; long-period normals, means and extremes; excessive short-duration rainfall; monthly and annual total sunshine and percent of possible; and monthly and annual solar radiation. (This publication issued on monthly basis also, GPO...$0.20)

1.9 "Selective Guide to Published Climatic Data Sources Prepared by the U. S. Weather Bureau," Key to Meteorological Records Documentation No. 4.11, 1963 (GPO...$0.50)

Describes the various types of climatic data published, presents examples of the formats of the publications, and tells how they may be obtained.

1.10 "Selected Climatic Maps of the United States," ESSA--Environmental Data Service (GPO...$0.25)

Describes the various climatic maps issued by the Environmental Data Service in a series called Climatic Maps of the United States (formerly named National Atlas). The maps are printed on 16" X 22" paper and may be obtained separately at an average cost of about 10 cents apiece. Elements depicted include: precipitation, temperature, heating and cooling degree days, relative humidity, possible sunshine, solar radiation, wind, evaporation and snowfall.

2. CLOUDS, LIQUID WATER CONTENT IN STORMS

2.1 "The Distribution of Liquid Water in Hurricanes," National Hurricane Project Report No. 62, 1963 (WB)

Presents data on liquid water content of clouds as measured by airplane flights through four hurricanes. Maximum value obtained was 9.5 g/m^3.

2.2 "Measurements by Aircraft of Condensed Water in Great Plains Thunderstorms," ESSA Technical Memorandum IERTM-NSSL-19, 1966 (WB)

Presents results obtained in flights on five thunderstorm days, in Oklahoma. Maximum value reported was 43.7 g/m^3. A diagram relating liquid water content to rainfall rate, indicates that 44 g/m^3 corresponds to 50 in./hr. Actual rain-gage measurements of up to 24-27 in./hr. for durations of a few minutes are reported.

3. DEWPOINTS, MAXIMUM PERSISTING

3.1 "Maximum Persisting 12-hour 1000-mb Dewpoints (°F), Monthly and of Record," Climatic Maps of the United States, 1960, GPO Catalog No. C30.22/4:D51 (GPO...$0.10)

Data are presented on U. S. maps (1:30,000,000).

4. DROUGHT

4.1 "Meteorological Drought," Weather Bureau Research Paper No. 45, 1965 (GPO...$0.40)

Develops an index of drought severity which permits time and regional comparisons.

5. EVAPORATION

5.1 "Mean Monthly and Annual Evaporation Data from Free Water Surface for the United States, Alaska, Hawaii, and the West Indies," Weather Bureau Technical Paper No. 13, 1950 (GPO...$0.15)

Presents tables of average monthly and annual pan evaporation for the period of record ending 1949 for 242 stations with Class A pans, and for 61 stations with pans other than Class A.

5.2 "Evaporation from Pans and Lakes," Weather Bureau Research Paper No. 38, 1955 (GPO...$0.20)

Describes techniques for estimating reservoir evaporation from pan evaporation and other meteorological data.

5.3 "Evaporation Maps of the United States," Weather Bureau Technical Paper No. 37, 1959 (GPO...$0.65)

Shows geographic distribution of average annual (1) Class A pan evaporation, (2) lake evaporation, and (3) Class A pan coefficient. Also shows geographic distribution of average May-October evaporation and standard deviation of annual Class A pan evaporation. Based on data for the period 1946-55 at 146 stations.

5.4 "Pan and Lake Evaporation," Climatic Maps of the United States, 1966, GPO Catalog No. C30.22/4:Ev1 (GPO...$0.10)

Data presented are same as those described in 5.3 above.

NOTE: Daily evaporation and wind movement are published in the monthly Climatological Data, and monthly and annual values in the annual issue.

6. FLOODS

6.1 "Kansas-Missouri Floods of June-July 1951," Weather Bureau Technical Paper No. 17, 1952 (GPO...$0.60)

Describes the storms and floods and presents flood scenes and tabulations of hourly and daily rainfall amounts and river stages.

6.2 "Floods of April 1952--Upper Mississippi, Missouri, Red River of the North," Weather Bureau Technical Paper No. 23, 1954 (GPO...$0.100)

Describes causes and development of the floods and presents daily meteorological and river stage data and flood scenes.

6.3 "Hurricane Rains and Floods of August 1955, Carolinas to New England," Weather Bureau Technical Paper No. 26, 1956 (GPO...$1.00)

Describes the storm and floods and presents flood scenes and tabulations of hourly and daily rainfall amounts for eastern States from South Carolina to Maine.

6.4 "Rainfall and Floods of April, May and June 1957 in the South-Central States," Weather Bureau Technical Paper No. 33, 1958 (GPO...$1.75)

Describes the storms and floods and presents flood scenes and tabulations of hourly and daily rainfall amounts for stations in the storm area, Texas to Missouri.

6.5 "Meteorology of Hypothetical Flood Sequences in the Mississippi River Basin," Hydrometeorological Report No. 35, 1959 (WB)

Describes meteorological situations associated with historical floods and derives hypothetical floods for design purposes by combining historical floods.

6.6 "Snowmelt Floods of March-April 1960, Missouri and Upper Mississippi Basins," Weather Bureau Technical Paper No. 45, 1962 (GPO...$1.25)

Describes causes and development of the floods and presents precipitation and river stage data and flood scenes.

6.7 "The March-May 1965 Floods in the Upper Mississippi, Missouri and Red River of the North Basins," ESSA Technical Report WB-4, 1967 (GPO...$0.60)

Presents statistics on flood and crest stages, areas and periods of flooding, warnings issued and flood damages. Describes the meteorological events leading to these record-breaking floods.

NOTE: Descriptions of flood conditions are published regularly in Climatological Data, National Summary (see item 1.8)

7. HYDROLOGIC CYCLE

7.1 "The Hydrologic Cycle," ESSA/PI 67003 1967 (GPO...$0.15)

Describes the atmospheric, precipitation and land phases of the cycle as they pertain to the United States, and the Weather Bureau's observational networks and hydrologic services.

8. NETWORKS, HYDROLOGIC

8.1 "River Basin Maps Showing Hydrologic Stations," Notes on Hydrologic Activities Bulletin No. 11, Inter-Agency Committee on Water Resources Subcommittee on Hydrology, 1961 (X)

A series of 89 contiguous river basin maps for the United States showing hydrologic networks as of early 1959. Most of the maps are scaled at about 15 miles to the inch and show locations of precipitation, temperature, evaporation, snow survey, streamflow, meteorological radar and water quality stations. Recording and non-recording instruments are identified. (This is not an ESSA publication, but was prepared under Weather Bureau supervision.)

9. PRECIPITABLE WATER

9.1 "Mean Precipitable Water in the United States," Weather Bureau Technical Paper No. 10, 1949 (GPO...$0.30)

Presents tabulations and maps showing average monthly and annual distribution of atmospheric moisture in the layers from the surface to 8 km., and from 2 to 8 km., over the 48 States. Based on periods of record ending 1943.

9.2 "Tables of Precipitable Water and Other Factors for a Saturated Pseudo-Adiabatic Atmosphere," Weather Bureau Technical Paper No. 14, 1951 (X)

Presents tables showing variation with height of atmospheric moisture, pressure and temperature.

10. PRECIPITATION, COMPUTED

10.1 "A Comparison of Kinematically Computed Precipitation with Observed Convective Rainfall," ESSA Technical Memorandum IERTM-NSSL-25, 1965 (WB)

Observed wind and moisture patterns in an extensive squall-line development are used to compute precipitation from a continuity equation for moist air. Horizontal flux of water vapor accounts for about 80 percent of observed rainfall, and when the local change in water vapor content is included in the moisture-balance equation, the computed budget accounts for 95 percent of the actual rainfall production.

11. PRECIPITATION, DEPTH-AREA-DURATION ANALYSIS

11.1 "Manual for Depth-Area Duration Analysis of Storm Precipitation," Weather Bureau Cooperative Studies Technical Paper No. 1, 1946 (WB)

Describes the standard procedure used by various Federal agencies for making these analyses.

12. PRECIPITATION, EXCESSIVE AND MAXIMUM OBSERVED

12.1 "Excessive Precipitation Techniques," Key to Meteorological Records Documentation No. 3.081, 1958 (GPO...$0.10)

Discusses the various criteria used for defining excessive precipitation and the different ways the data were measured and published. Names the various periodicals in which these data were published.

NOTE: Excessive precipitation data are published in the annual issue of Climatological Data, National Summary (item 1.8 above).

12.2 "Maximum Recorded United States Point Rainfall for 5 Minutes to 24 Hours at 207 First-Order Stations," Weather Bureau Technical Paper No. 2, rev. 1963 (GPO...$0.40)

Data are presented in tables and on maps.

12.3 "Maximum 24-Hour Precipitation in the United States," Weather Bureau Technical Paper No. 16, 1952 (X)

Presents tables of maximum 24-hour amounts for the period of record ending 1949 for 7,355 stations in the 48 States.

12.4 "Maximum Station Precipitation for 1, 2, 3, 6, 12 and 24 Hours," Weather Bureau Technical Paper No. 15, (GPO)

Part I: Utah, 1951, .25; Part II: Idaho, 1951, .25; Part III: Florida, 1952, .45; Part IV: Maryland, Delaware, and District of Columbia, 1953, .25; Part V: New Jersey, 1953, .25; Part VI: New England, 1953, .60; Part VII: South Carolina, 1953, .25; Part VIII: Virginia, 1954, .50; Part IX: Georgia, 1954, .40; Part X: New York, 1954, .60; Part XI: North Carolina, 1955, .55; Part XII: Oregon, 1955, .55; Part XIII: Kentucky, 1955, .45; Part XIV: Louisiana, 1955, .35; Part XV: Alabama, 1955, .35; Part XVI: Pennsylvania, 1956, .65; Part XVII: Mississippi, 1956, .40; Part XVIII: West Virginia, 1956, .35; Part XIX: Tennessee, 1956, .45; Part XX: Indiana, 1956, .55; Part XXI: Illinois, 1958, .50; Part XXII: Ohio, 1958, .65; Part XXIII: California, 1959, $1.50; Part XXIV: Texas, 1959, $1.00; Part XXV: Arkansas, 1960, .50; Part XXVI: Oklahoma 1961, .45.

Presents tables of maximum amounts for the period 1940-50 for about 2,000 recording-gage stations in 27 States.

13. PRECIPITATION, MEAN AND NORMAL

13.1 "Mean Annual Total Snowfall (inches)," Climatic Maps of the United States, rev. 1966, Catalog No. C30.22/4:Sn6 (GPO...$0.10)

Data based on period of record through 1960 are presented on a map (1:10,000,000). Reverse side shows mean monthly snowfall for selected stations.

13.2 "Normal Annual Total Precipitation," Climatic Maps of the United States, rev. 1966, Catalog No. C30.22/4:P91/7 (GPO...$0.10)

Map (1:10,000,000) showing normal annual precipitation (in.) based on period 1931-60 for the United States. Reverse side shows normal total precipitation by months for 100 selected stations.

13.3 "Normal Monthly Total Precipitation," Climatic Maps of the United States, 1965, Catalog No. C52.11:P91pt. 1-3 (GPO...set of 3 maps, $0.30)

Data, based on period 1931-60, are presented on 12 maps of about 1:15,000,000 scale.

13.4 "Mean Number of Days with 0.01 Inch or More of Precipitation, Monthly and Annual," Climatic Maps of the United States, 1963, Catalog No. C30.22/4:P91/6 (GPO...$0.10)

Data are presented on U. S. maps (1:30,000,000).

13.5 "Normal Monthly Number of Days with Precipitation of 0.5, 1.0, 2.0 and 4.0 Inches or More in the Contiguous United States," Weather Bureau Technical Paper No. 57, 1966 (GPO...$1.50)

Four series of 12 U. S. maps each (1:10,000,000) present data based on period 1931-60.

NOTE: See item 1.5 for monthly normals of precipitation.

14. PRECIPITATION MEASUREMENTS

14.1 "History of Weather Bureau Precipitation Measurements," Key to Meteorological Records Documentation No. 3.082, 1963 (GPO...$0.15)

Describes the various gages that have been used or are now in use and how the measurements are made.

NOTE: See item 17.1 for radar measurement of precipitation

15. PRECIPITATION, PROBABILITY (RAINFALL FREQUENCY)

15.1 "Rainfall Intensity-Duration-Frequency Curves for Selected Stations in the United States, Alaska, Hawaiian Islands and Puerto Rico," Weather Bureau Technical Paper No. 25, 1955 (X)

Curves for 203 stations show 5-min. to 24-hr. intensities for return periods of 2, 5, 10, 25, 50 and 100 years.

15.2 "Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years," Weather Bureau Technical Paper No. 40, 1961, reprinted 1963 (GPO...$1.25)

Includes 49 maps showing 30-min., 1-, 2-, 6-, 12- and 24-hour point precipitation for return periods of 1, 2, 5, 10, 25, 50 and 100 years, and interpolation diagrams for obtaining values for intermediate durations and return periods. Ratios for obtaining 5-, 10- and 15-min. precipitation from 30-min. values are also presented. Area-reduction curves for reducing point values for areas up to 400 sq. mi. are included.

15.3 "Generalized Estimates of Probable Maximum Precipitation and Rainfall-Frequency Data for Puerto Rico and Virgin Islands," Weather Bureau Technical Paper No. 42, 1961 (GPO...$0.50)

Presents same type of data described in 15.2 above.

15.4 "Rainfall-Frequency Atlas of the Hawaiian Islands for Areas to 200 Square Miles, Durations to 24 Hours, and Return Periods from 1 to 100 Years," Weather Bureau Technical Paper No. 43, 1962 (GPO...$0.40)

Presents same type of data described in 15.2 above.

15.5 "Probable Maximum Precipitation and Rainfall-Frequency Data for Alaska for Areas to 400 Square Miles, Durations to 24 Hours, and Return Periods from 1 to 100 Years," Weather Bureau Technical Paper No. 47, 1963 (GPO...$1.00)

Presents same type of data described in 15.2 above.

15.6 "Two- to Ten-Day Precipitation for Return Periods of 2 to 100 Years in the Contiguous United States," Weather Bureau Technical Paper No. 49, 1964 (GPO...$1.00)

Includes 24 maps showing 2-, 4-, 7- and 10-day point precipitation for return periods of 2, 5, 10, 25, 50 and 100 years and interpolation diagrams for obtaining values for intermediate durations and return periods. Area-reduction curves for reducing point values for areas up to 400 sq. mi. are also included.

15.7 "Two- to Ten-Day Rainfall for Return Periods of 2 to 100 Years in the Hawaiian Islands," Weather Bureau Technical Paper No. 51, 1965 (GPO...$0.30)

Presents same type of data described in 15.6 above.

15.8 "Two- to Ten-Day Precipitation for Return Periods of 2 to 100 Years in Alaska," Weather Bureau Technical Paper No. 52, 1965 (GPO...$0.60)

Presents same type of data described in 15.6 above.

15.9 "Two- to Ten-Day Rainfall for Return Periods of 2 to 100 Years in Puerto Rico and Virgin Islands," Weather Bureau Technical Paper No. 53, 1963 (GPO...$0.30)

Presents same type of data described in 15.6 above.

NOTE: See item 25.12.

15.10 "Climatological Probabilities of Precipitation for the Conterminous United States," ESSA Technical Report WB-5, 1967 (GPO...$0.40)

Gives probabilities of 6-, 12- and 24-hour precipitation (0.01 inch or more), showing diurnal and seasonal trends.

16. PRECIPITATION, PROBABLE MAXIMUM

16.1 "Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24 and 48 Hours," Hydrometeorological Report No. 33, 1956 (WB)

Presents maps showing the 24-hour, 200-sq. mi. probable maximum precipitation and curves for adjusting those values for durations of 6, 12 and 48 hours and for areas from 10 to 1,000 sq. mi.

16.2 "Generalized Estimates of Probable Maximum Precipitation for the United States West of the 105th Meridian for Areas to 400 Square Miles and Durations to 24 Hours," Weather Bureau Technical Paper No. 38, 1960 (GPO...$1.00)

Discusses major storms and presents maps showing 1-, 6-, and 24-hour probable maximum precipitation for 10 sq. mi. An interpolation diagram and area-reduction curves are provided for estimating values for intermediate durations and areas up to 400 sq. mi.

16.3 "Generalized Estimates of Probable Maximum Precipitation and Rainfall Frequency Data for Puerto Rico and Virgin Islands," Weather Bureau Technical Paper No. 42, 1961 (GPO...$0.50)

Presents maps showing 1-, 6-, and 24-hour probable maximum point precipitation and provides an interpolation diagram and area-reduction curves for obtaining values for intermediate durations and for areas up to 400 sq. mi.

16.4 "Interim Report on Probable Maximum Precipitation in California," Hydrometeorological Report No. 36, 1962 (WB)

Provides a procedure for estimating probable maximum precipitation for durations up to 72 hours and for areas up to 5,000 sq. mi.

16.5 "Probable Maximum Precipitation and Rainfall-Frequency Data for Alaska for Areas to 400 Square Miles, Durations to 24 Hours, and Return Periods from 1 to 100 Years," Weather Bureau Technical Paper No. 47, 1963 (GPO...$1.00)

Same type of data described in 15.3 above.

16.6 "Probable Maximum Precipitation in the Hawaiian Islands," Hydrometeorological Report No. 39, 1963 (WB)

Presents point values of 24-hour PMP on maps and a depth-area-duration relation for reducing those values for durations down to 30 min. and for areas up to 200 sq. mi.

16.7 "Probable Maximum Precipitation over the Susquehanna River Basin above Harrisburg, Pa.," Hydrometeorological Report No. 40, 1965 (WB)

Presents estimates for durations from 6 to 72 hours and for areas from 10 sq. mi. to total basin area (24,100 sq. mi).

16.8 "Probable Maximum and TVA Precipitation over the Tennessee River Basin above Chattanooga," Hydrometeorological Report No. 41, 1965 (GPO...$0.75)

Presents estimates for durations from 6 to 72 hours for the total basin (21,400 sq. mi.) and one sub-area (7,980 sq. mi.). Variation of PMP during March-September season is also given.

16.9 "Meteorological Conditions for the Probable Maximum Flood on the Yukon River above Rampart, Alaska," Hydrometeorological Report No. 42, 1966 (GPO...$0.70)

Presents estimates of probable maximum precipitation and critical values of temperature, wind, and snow cover for optimum snowmelt conditions.

16.10 "Probable Maximum Precipitation, Northwest States," Hydrometeorological Report No. 43, 1966 (GPO...$1.75)

Presents generalized estimates of probable maximum precipitation for areas up to 5,000 sq. mi. and durations to 72 hours. Also presents critical sequences of wind, temperature and dewpoint for optimum snowmelt conditions.

16.11 "Meteorological Estimation of Extreme Precipitation for Spillway Design Floods," ESSA Technical Memorandum WBTM HYDRO-5, 1967 (WB)

Reviews the reasons for the meteorological approach to design in the United States, summarizes the procedures for estimating probable maximum precipitation, and examines trends.

16.12 "Probable Maximum Precipitation on the Upper South Platte River, Colorado, and Upper Mississippi River, Minnesota," Hydrometeorological Report No. 44, 1968 (GPO...in preparation)

Presents several critical isohyetal patterns for determining the probable maximum flood on the Upper South Platte River above Chatfield, Colorado, and on eight sub-basins of the Minnesota River. Critical sequences of 6-hr. rainfall increments are included.

17. RADAR (HYDROLOGIC USES)

17.1 "The Uses of Radar in Flash Flood Forecasting," ESSA Southern Region Technical Memorandum No. 23, 1966 (WB)

Presents the results of correlation studies between a dense network of raingages in Oklahoma (175 recording gages in 1100 sq. mi.) and the WSR-57 radar at Norman, Okla. It is shown that radar can assess areal rainfall in shower type precipitation significantly better than the present raingage network density.

18. RADIATION, SOLAR AND SKY

18.1 "Sunshine and Cloudiness at Selected Stations in the United States, Alaska, Hawaii and Puerto Rico," Weather Bureau Technical Paper No. 12, 1951 (GPO...$0.15)

Average monthly values based on period of record ending 1948 are presented in tabular form for about 80 U. S. stations.

18.2 "Weekly Mean Values of Daily Total Solar and Sky Radiation," Weather Bureau Technical Paper No. 11, 1949 (GPO...$0.15) Supplement No. 1, 1955 (GPO...$0.05)

Presents seasonal variation curves of radiation for 30 U. S. stations. The supplement presents data for an additional five stations.

18.3 "Mean Daily Solar Radiation, Monthly and Annual," Climatic Maps of the United States, 1964, Catalog No. C30.22/4:So4 (GPO...$0.10)

Data (in langleys) are shown on U. S. maps (1:30,000,000).

18.4 "Mean Total Hours of Sunshine, Monthly and Annual," Climatic Maps of the United States, 1963, Catalog No. C30.22/4:Su2 (GPO...$0.10)

Data, based on period 1931-60, are presented on 1:30,000,000 maps.

18.5 "Mean Percentage of Possible Sunshine, Monthly and Annual," Climatic Maps of the United States, 1960, Catalog No. C30.22/4:Su7 (GPO...$0.10)

Data, based on 164 stations with 20 or more years of record through 1959, are presented on 1:30,000,000 maps.

NOTE: See item 1.8 for monthly and annual sunshine and percent of possible, and monthly and annual solar radiation.

19. RELATIVE HUMIDITY

19.1 "Mean Relative Humidity (%), Monthly and Annual," Climatic Maps of the United States, 1966, Catalog No. C30.22/4:H88 (GPO...$0.10)

Data, based on 236 stations with 20 years or more of record through 1959, are presented on 1:30,000,000 maps.

20. RIVER AND FLOOD FORECASTING

20.1 "Floods and Flood Warnings," ESSA/PI 660030, 1966 (GPO...$0.10)

Describes the Weather Bureau's river and flood forecast service, and prescribes safety rules for minimizing inconveniences and loss of life and property from floods.

20.2 "Elements of River Forecasting," ESSA Technical Memorandum WBTM-HYDRO-4, 1967 (WB)

An elementary explanation of how to forecast (1) volume of surface runoff, (2) distribution of volume at a point, and (3) change in hydrograph as water moves downstream.

NOTE: See items 7.1 and 29.1.

21. RIVER STAGES

21.1 Daily River Stages (year), (GPO...Issues for years prior to 1950 are out of print. Price of available issues: 1950, 1956, 1957, 1958 are each $1.25; 1951, 1952, 1953, 1954, 1955, 1959, 1960, 1961, 1962 and 1963 are each $1.00; 1964 in press)

Presents daily river gage data, highest stages of record, and descriptions of gage locations.

22. RUNOFF

22.1 "Predicting the Runoff from Storm Rainfall," Weather Bureau Research Paper No. 34, 1951 (GPO...$0.05)

Describes the technique for developing graphical rainfall-runoff relations.

22.2 "Methods of Flow Frequency Analysis," (see item 27.1).

22.3 "A Uniform Technique for Determining Flood Flow Frequencies," (see item 27.2).

23. SNOW

23.1 "Frequency of Maximum Water Equivalent of March Snow Cover in North Central United States," Weather Bureau Technical Paper No. 50, 1964 (GPO...$0.25)

Describes relationships between maximum snow depths and their water equivalents. Presents two sets of six maps each showing water equivalent for the first and second halves of March for return periods of 2, 5, 10, 25, 50 and 100 years.

23.2 "Mean Annual Total Snowfall," Climatic Maps of the United States, rev. 1966, Catalog No. C30.22/4:Sn6 (GPO...$0.10)

Data based on period of record through 1960 are presented on a U. S. map (1:10,000,000). Reverse side of this map shows mean monthly snow fall for 75 selected stations.

23.3 Snow Cover Surveys by Eastern Snow Conference, (WB)

This annual report presents monthly data on snow depths and water equivalents for the season December through April. The data are for some 700 stations in New England, New York and Pennsylvania.

23.4 Storage-Gage Precipitation Data for Western United States (GPO...$0.50)

This annual publication presents data from remote areas from gages that require reading and maintenance only at monthly or seasonal intervals.

24. STATION HISTORY

24.1 "Substation History for (name of State)," Key to Meteorological Records Documentation No. 1.1 (GPO...$0.25 to $1.25; price list on pages 26 and 27.)

Summarizes information on substation locations, elevations, exposures, instrumentations, records and observers from date station was established up to about 1955.

NOTE: Similar information is provided for some Weather Bureau first-order stations in Local Climatological Data with Comparative Data (see item 1.2).

24.2 "Decadal Census of Weather Stations, (name of State)," Key to Meteorological Records Documentation No. 6.11 (GPO...$0.05 to $0.15; price list on pages 26 and 27.)

Presents seven maps showing weather stations in existence in January of the year 1890, 1900, 1910, 1920, 1930 and 1950.

25. STORMS (THUNDERSTORMS, TROPICAL STORMS, AND HURRICANES)

25.1 "Mean Number of Thunderstorm Days in the United States," Weather Bureau Technical Paper No. 19, 1952 (GPO...$0.15)

Tabulations and maps show mean monthly and seasonal number of days with thunderstorms for 266 U. S. stations.

25.2 "Meteorology of Flood-Producing Storms in the Mississippi River Basin," Hydrometeorological Report No. 34, 1956 (WB)

Describes characteristics of outstanding storms.

25.3 "Rainfall Associated with Hurricanes," National Hurricane Research Project Report No. 3, 1956 (WB)

Presents meteorological summaries, isohyetal maps, and maximum depth-area-duration data for over 200 tropical storms.

25.4 "Meteorology of Hydrologically Critical Storms in California," Hydrometeorological Report No. 37, 1962 (WB)

Describes characteristics of outstanding storms.

25.5 "Three-Dimensional Wind Flow and Resulting Precipitation in a Northern California Storm," Weather Bureau Research Paper No. 44, 1963 (GPO...$0.35)

A reconstruction of the temperature, wind, pressure and moisture distributions in a major storm.

25.6 "Tropical Cyclones of the North Atlantic," Weather Bureau Technical Paper No. 55, 1965 (GPO...$0.70)

Tracks and frequencies of tropical storms and hurricanes 1871-1963. Tracks are shown on maps for each year and by months and by other calendar periods.

25.7 "The Role of Persistence, Instability, and Moisture in the Intense Rainstorms in Eastern Colorado, June 14-17, 1965," ESSA Technical Memorandum WBTM HYDRO-3, 1967 (WB)

Evaluates the meteorological characteristics of the rain-favoring inflow of air into the storm, which caused widespread flooding and the greatest flood of record in Denver.

25.8 "Effects of Tropical Cyclone Rainfall on the Distribution of Precipitation Over the Eastern and Southern United States," ESSA Professional Paper No. 1, 1967 (GPO...$0.50)

Describes the effects of tropical storm rainfall on the distribution of mean precipitation over the eastern and southern United States.

25.9 "Florida Hurricanes," ESSA Technical Memorandum WBTM SR-38, 1967 (WB)

Shows tracks of major hurricanes since 1900 and presents rainfall, wind and pressure statistics of the great ones.

25.10 "Meteorology of Major Storms in Western Colorado and Eastern Utah," ESSA Technical Memorandum WBTM HYDRO-7, 1968 (WB)

Analyzes 42 major storms for determining relative influence of moisture, topography and proximity of upper Lows or troughs on precipitation.

25.11 "Climatological Regime of Rainfall Associated with Hurricanes After Landfall," ESSA Technical Memorandum WBTM ER-29, 1968 (WB)

Defines the average rainfall patterns associated with hurricanes entering the U. S. coastline bordering the Gulf of Mexico and Atlantic Ocean.

25.12 "Frequency and Areal Distributions of Tropical Storm Rainfall in the United Coastal Regions on the Gulf of Mexico," ESSA Technical Report WB-7, 1968 (GPO...in press)

Discusses rainfall within 150 miles of the storm track and 100 miles inside the coastline during the period from 24 hours before landfall to 24 hours after.

NOTE: See items 2.1 and 2.2 for liquid water content of clouds.

26. STORM SURGES

26.1 "Characteristics of the Hurricane Storm Surge," Weather Bureau Technical Paper No. 48, 1963 (GPO...$0.70)

Describes development of storm surges and presents data on outstanding hurricane-produced surges along the Gulf and Atlantic Coasts.

27. STREAMFLOW FREQUENCY ANALYSES

27.1 "Methods of Flow Frequency Analysis," Notes on Hydrologic Activities Bulletin No. 13, Inter-Agency Committee on Water Resources, Subcommittee on Hydrology, 1966 (GPO...$0.35)

Describes the five methods most commonly used by Federal agencies for making frequency studies of runoff at individual streamflow stations. Some of these methods are also used for analysis of rainfall frequency.

27.2 "A Uniform Technique for Determining Flood Flow Frequencies," Bulletin No. 15, Water Resources Council Committee on Hydrology, 1967 (WB)

Recommends the log-Pearson Type III method for flood flow frequency analysis and described its application.

NOTE: These are not ESSA publications, but ESSA is represented in the Subcommittee on Hydrology.

28. TEMPERATURE

28.1 "Normal Daily Maximum, Minimum, Average, and Range of Temperature," Climatic Maps of the United States, 1966, Catalog No. C52.11:T24/pt. 1-12 (GPO...set of 12 maps, $1.25)

Data, based on period 1931-60, are presented on maps (1:20,000,000) -- 4 maps on each of the 12 sheets (one for each month). Reverse side of each sheet presents graphs for about 80 stations showing the highest and lowest temperatures of record through 1964 and the normal maximum, average and minimum temperatures for the month.

28.2 "Mean Annual Number of Days Minimum Temperature 32°F and Below," Climatic Maps of the United States, 1962, Catalog No. C30.22/4:T24/9 (GPO...$0.10)

Data are presented on a 1:10,000,000 map. Reverse side presents similar data for selected stations on a monthly basis.

28.3 "Mean Dates of Last 32°F Temperature in Spring and First 32°F Temperature in Autumn," Climatic Maps of the United States, 1966 Catalog No. C52.11:T24/3 (GPO...$0.10)

Data, based on 2565 station records 1921-50, are presented on 1:10,000,000 maps.

28.4 "Mean Length of Freeze-Free Period," Climatic Maps of the United States, 1962, Catalog No. C30.22/4:F87 (GPO...$0.10)

Maps (1:10,000,000) based on 2565 station records for period 1921-50, shows mean number of days between last 32°F in spring and first 32°F in autumn. Reverse side presents a tabulation of mean monthly number of days with minimum temperature 32°F and below for about 140 stations.

29. WATER MANAGEMENT

29.1 "The Weather Bureau and Water Management," Weather Bureau, 1965 (GPO...$0.40)

A description of the Weather Bureau's river and water-supply forecasting services and hydrometeorological research for water management planning and design.

30. WATER SUPPLY FORECASTS

30.1 Water Supply Forecasts for the Western United States (WB)

Issued as of the first of each month from January to May. Presents estimates of water-year flow to be expected from numerous watersheds west of 104°W.

30.2 Water Supply Forecasts for the Northeastern United States (WB)

Issued as of the first of each month from January to April. Presents estimates of water-year flow to be expected from various watersheds in New England and New York.

31. WIND

31.1 "History of Weather Bureau Wind Measurements," Key to Meteorological Records Documentation No. 3.151, 1963 (GPO...$0.40)

Describes various types of anemometers that have been used or are now in use.

31.2 "Prevailing Direction, Mean Speed, and Fastest Mile of Wind," Climatic Maps of the United States, 1964, Catalog No. C30.22/4:W72 (GPO...$0.10)

Data are presented on monthly maps (1:30,000,000).

31.3 "Surface Wind Roses," Climatic Maps of the United States, 1966 (GPO...set of 2 sheets $0.20)

Wind roses, based on hourly observations for the period 1951-60 at about 80 stations, are presented on 13 1:15,000,000 maps (12 monthly, 1 annual). Resultant winds for middle months of each of the four seasons are shown also on separate maps.

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PRICE LIST

State	Climatography of the U. S. No. 11	No. 60	No. 86	Key to Meteorological Records Documentation No. 1.1	No. 6.11
Alabama	$ 0.30	$ 0.10	$ 0.35	$ 0.35	$ 0.05
Alaska	0.25	0.15	0.35	0.50	n.a.
Arizona	0.35	0.10	0.45	0.50	0.05
Arkansas	0.30	0.10	0.35	0.45	0.05
California	0.70	0.25	1.00	1.25	0.10
Colorado	0.35	0.10	0.45	0.50	0.05
Connecticut	*	0.10	*	*	*
Delaware	**	0.15	**	**	**
District of Columbia	**	**	**	**	**
Florida	0.25	0.15	0.35	0.35	0.05
Georgia	0.25	n.a.	0.35	0.35	0.05
Hawaii	0.50	0.15	0.50	0.40	n.a.
Idaho	0.25	0.10	0.35	0.40	0.05
Illinois	0.35	0.10	0.40	0.35	0.10
Indiana	0.25	0.10	0.35	0.35	0.10
Iowa	0.35	0.10	0.45	0.35	0.05
Kansas	0.35	0.10	0.45	0.50	0.05
Kentucky	0.25	0.10	0.35	0.30	0.05
Louisiana	0.25	0.10	0.35	0.35	0.05
Maine	*	0.10	*	*	*
Maryland	0.25	0.15	0.35	0.25	0.05
Massachusetts	*	0.10	*	*	*
Michigan	0.30	0.15	0.40	0.35	0.05
Minnesota	0.25	0.10	0.35	0.35	0.05
Mississippi	0.25	0.10	0.35	0.35	0.05
Missouri	0.35	0.10	0.45	0.45	0.05
Montana	0.35	0.15	0.50	0.50	0.05
Nebraska	0.35	0.10	0.45	0.45	0.05
Nevada	0.20	0.10	0.25	0.30	0.05
New England	0.45	n.a.	0.65	0.60	0.15
New Hampshire	*	0.10	*	*	*
New Jersey	0.20	0.10	0.25	0.15	0.05
New Mexico	0.50	0.10	0.50	0.50	0.05
New York	0.35	0.15	0.50	0.65	0.05
North Carolina	0.25	0.15	0.45	0.35	0.05
North Dakota	0.25	0.10	0.40	0.25	0.05
Ohio	0.30	0.15	0.40	0.45	0.05
Oklahoma	0.35	0.10	0.45	0.50	0.05
Oregon	0.40	0.10	0.45	0.50	0.05
Pacific Islands	***	n.a.	***	***	n.a.
Pennsylvania	0.40	0.15	0.45	0.65	0.05
Puerto Rico & Virgin Is.	0.25	0.15	0.25	0.20	n.a.
Rhode Island	*	0.10	*	*	*
South Carolina	0.25	0.10	0.25	0.25	0.05
South Dakota	0.25	0.10	0.40	0.35	0.05

PRICE LIST, Cont'd.

States	Climatography of the U. S. No. 11	No. 60	No. 86	Key to Meteorological Records Documentation No. 1.1	No. 6.11
Tennessee	$ 0.25	$ 0.10	$ 0.45	$ 0.40	$ 0.05
Texas	0.25	0.10	0.55	1.00	0.10
Utah	0.25	0.10	0.35	0.45	0.05
Vermont	*	0.10	*	*	*
Virginia	0.25	0.10	0.35	0.35	0.05
Washington	0.40	0.15	0.45	0.50	0.05
West Virginia	0.25	0.10	0.30	0.35	0.05
Wisconsin	0.35	0.10	0.40	0.35	0.05
Wyoming	0.25	0.10	0.40	0.40	0.05

Legend

* Included in New England issue
** Included in Maryland issue
*** Included in Hawaii issue
n.a. Not available