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INVENTORY OF UNPUBLISHED HYDROLOGIC DATA

BY
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Prepared for the
SUBCOMMITTEE ON SMALL WATER STORAGE PROJECTS
OF THE WATER RESOURCES COMMITTEE
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FOREWORD

This inventory makes available for the first time references to a large volume of unpublished hydrologic data which heretofore have not been readily available to engineers, hydrologists, and other technicians concerned with their use. The inventory indicates the general scope of the unpublished data available in the files of the Weather Bureau and Smithsonian Institution, lists specific references to other unpublished data in the United States, and provides a check list of references to published but obscure records. The inventory has been approved by the subcommittee on small water-storage projects created by the Water Resources Committee of the National Resources Committee. It is published as a water-supply paper of the Geological Survey in order that it may be available in one of the regular serial publications concerned with hydrologic data.

Successive reports of the special advisory committee on standards and specifications for hydrologic data, and particularly the report entitled "Deficiencies in basic hydrologic data," published by the National Resources Committee in September 1936, have done much to make our citizenry conscious of the basic needs in this field. The awakening interest in the extension of facilities for collecting hydrologic data has stimulated the realization that some important records, collected and preserved with much care, have never been adequately published.

During some of the conferences relating to the preparation of the joint Federal manual on low dams, likewise sponsored by the subcommittee, it was reported that considerable accumulations of unpublished hydrologic data are to be found in the archives and storage vaults of many Federal bureaus, as well as of State and local agencies. The urgent need for more basic data of this character was so apparent in connection with hydrologic studies outlined in the above-mentioned manual as to warrant the launching of a new project for locating, examining, listing, and appraising all available unpublished hydrologic data. This publication includes the location, type of station, years of record, and name and address of official or agency making the

record and is designed to inform engineers of existing unpublished records and of their character and scope. One full-time investigator, W. T. Holland, was engaged under the immediate direction of C. S. Jarvis, and they consulted almost daily over a period of about 6 months to assemble, classify, and tabulate the material.

It is hoped that funds will be supplied to the Weather Bureau for making an index of the unpublished hydrologic records in the files of the Smithsonian Institution and Weather Bureau and for the publication of such portions of the data as are deemed most worthy of reproduction. Meanwhile it is hoped that this inventory may prove useful to technicians having immediate need for data which at present are not published or indexed.

Reference to an observation station is not to be considered as an endorsement of the validity of the record of that station. Persons desiring to use unpublished hydrologic data are cautioned against use without appropriate discrimination as to the conditions under which the observations were made. Withholding of credence or acceptance of questionable hydrologic records may be very decidedly preferable to basing estimates or designs on doubtful or possibly misleading data.

Perry A. Fellows, Chairman, Works Progress Administration; R. W. Davenport, Geological Survey; C. S. Jarvis, Soil Conservation Service; Lewis A. Jones, Bureau of Agricultural Engineering; P. I. Taylor, Bureau of Reclamation; T. W. Norcross, Forest Service; E. F. Preece, National Park Service, Thorndike Saville, New York University; and A. L. Wathen, Office of Indian Affairs.

MARCH 22, 1937.

PROCEDURE FOR OBTAINING COPIES OF ORIGINAL DATA

Persons wishing to obtain copies of the original data should apply directly to the agencies or persons listed under the appropriate column in the listings. Neither the Geological Survey nor the National Resources Committee has copies of the original data on file. The complete replies to the questionnaire are, however, on file for public inspection in the office of the Water Resources Committee. That file also contains a record of the observation stations being maintained by camps of the Civilian Conservation Corps during the fall of 1936.

It is expected that persons wishing to obtain copies of original data from the collecting agencies or individuals will be willing to pay the cost of reproduction of records.

SCOPE OF WORK

This inventory comprises three separate analyses as follows:

1. *Notes on early records available only in files of United States Weather Bureau and Smithsonian Institution.*—A large volume of unpublished data is available in these files. Limitations of time and funds prevented a complete indexing of the files, but the notes indicate the general scope, reliability, and availability of the records.

2. *Inventory of unpublished hydrologic data.*—This is a classified list, arranged alphabetically by States, showing observation stations reported by Federal, State, or local agencies having apparently trustworthy and relatively accurate records, which have not been published and for the publication of which provisions have not been made. About 17,000 stations having approximately 190,000 station-years of record are listed. The basic records themselves may be obtained only from the agencies responsible for their collection. No claim is made as to the completeness of this inventory. Some items submitted by reporting agencies were so indefinite as to location, function, and scope of record or so nearly duplicated other items listed herein as to warrant their exclusion. Furthermore, some casual evidence has been encountered tending to prove the existence of other unpublished or obscure masses of hydrologic data not yet specifically reported nor definitely located.

3. *Bibliography of published but obscure records of hydrologic data.*—This bibliography indicates the major sources of published hydrologic data other than the serial publications of the United States Weather Bureau and the Geological Survey. It is intended to afford ready reference to many records appearing in State and local publications, in other miscellaneous reports, and in periodicals not devoted primarily to hydrologic data and therefore not circulated widely enough to be generally available.

METHOD OF PREPARING INVENTORY

The inventory of unpublished hydrologic data was prepared by means of circulating questionnaires to all Federal, State, and local agencies and private institutions that were thought to be collecting or to have collected hydrologic data. A copy of the questionnaire is given on pages 4–5. Replies from the questionnaire were examined, records obviously of slight value were eliminated, and many of the reporting agencies were requested to furnish additional information concerning the duration of records and type of observation stations.

The listing of a record does not indicate that in the opinion of the reviewers or the subcommittee the record is of undoubted validity. Persons desiring to use the records are directed to the collecting agencies for more specific information concerning the conditions under which observations were taken.

NATIONAL RESOURCES COMMITTEE
WATER RESOURCES COMMITTEE
WASHINGTON, D. C.

Form for reporting unpublished hydrologic data not as yet scheduled or financed for early publication

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Name of official_____
Agency_____
Address_____

The Water Resources Committee and its subcommittee on small water-storage projects are engaged in locating, listing, and appraising unpublished hydrologic data of any of the usual types applicable to either small or large areas. As an aid in locating and reporting such data, the following suggestive headings have been prepared:

	Approximate number of stations	Period covered
Standard U. S. Weather Bureau rain gage		
Snow-measurement stations		
Nonrecording nonstandard rain gage		
Recording U. S. Weather Bureau rain gage and temperature		
Ground-water observation well equipped with a recorder		
Ground-water observation well		
Lake and reservoir stages		
Gaging stations, recording gage		
Gaging stations, staff gage		
Central meteorological station consisting of recording rain gage with maximum and minimum thermometer		
Standard U. S. Weather Bureau class A evaporation pan complete with psychrometer, anemometer, thermometers, still well, hook gage, and recording rain gage		
Nonstandard evaporation pans		
Anemometer and wind vane		
Anemometer and wind vane, recording		
Transpiration		
Miscellaneous		

Brief description concerning the location and character of the observations, the apparent accuracy or reliability, and value for future consideration:

Please indicate in the space below any local agencies, either Governmental or private, likely to have additional unpublished hydrologic data.

Name of agency	Address

Proper acknowledgment is assured for all who contribute information as a result of this inquiry; and a copy of inventory including such contributions will be furnished.

In the event that publication is authorized and your data are found to be suitable for inclusion, what is the approximate number of copies required for your organization? _____

In order to be of most service, replies to this inquiry should be received as early in November as is practicable. A return envelope is enclosed herewith.

Very truly yours,

C. S. JARVIS,
For the Subcommittee on Small Water-Storage Projects.

NOTES ON EARLY RECORDS AVAILABLE ONLY IN FILES OF UNITED STATES WEATHER BUREAU AND SMITHSONIAN INSTITUTION

For several decades prior to the organization of the United States Weather Bureau, in 1890, meteorologic and other hydrologic data were being collected by various governmental and scientific agencies—for example, the Surgeon General's Office, Smithsonian Institution, Signal Service, and Army post hospitals—also by voluntary observers. Many of these records were originally filed in Boston, and some portions of them were destroyed by fire, while others show evidence of damage sustained from termites, or from early handling of loose script pages, the fading of ink, or exposure to moisture, prior to binding and storage in the vault of the United States Weather Bureau or prior to their placement elsewhere. The more notable of these early records are comprised under the following classifications:

At United States Weather Bureau, Washington, D. C.:

Surgeon General's Office, from about 1820 to 1877. Some of the records after 1860 are only monthly and yearly summaries.

Smithsonian Institution, from about 1843 to 1873.

Signal Service, from about 1870 to 1895.

Post hospital records, collected at military posts, mainly before 1861. Many breaks occur from 1861 to 1865.

Voluntary observers, from about 1865 to 1895.

At Smithsonian Institution, Washington, D. C.:

These records were collected by various agencies, assembled by the United States Weather Bureau, and during recent years transferred and stored in the attic of the Smithsonian Institution generally without indexing or classification.

The aforementioned records collected prior to 1895 have been published only in part. Monthly summaries for a number of the stations have been published in Bulletin W of the United States Weather Bureau.

RECORDS IN WEATHER BUREAU VAULT

MONTHLY METEOROLOGIC REGISTER OF SURGEON GENERAL'S OFFICE

1834.—Fort Independence, Boston, began recording precipitation in January under a column "Rain, inches," while outlying stations continued the prevailing practice of listing weather conditions only under such general headings as "Fair," "Cloudy," and "Rain."

1835.—Boston continued recording precipitation depths. In December Fort Jessup, La., began recording rainfall depths in inches. The data sheets issued to Fort Des Moines, Mich., included a column "Rain, inches," but no rainfall depths were recorded.

1836.—St. Louis began recording precipitation depths in July. Practically all stations, nearly as listed below, were supplied with a form containing a column "Rain, inches." Some of the 1836 reports were not received at headquarters until 1840.

1837–39.—The majority of stations, substantially as listed below, were recording precipitation depths.

1840.—The following stations recorded precipitation depths:

Mount Vernon Arsenal, Ala.
Fort Gibson, Ark.
Fort Smith, Ark.
Fort Towson, Ark.
Cedar Keys, E. Fla.
Fort Brooke, E. Fla.
Fort Keid, E. Fla.
Fort Snelling, Iowa.
Fort Leavenworth, Kans.
Fort Jessup, La.
U. S. Barracks, New Orleans, La.
Hancock Barracks, Maine.
Fort McHenry, Md.
Dearbornville, Mich.
Detroit Arsenal, Dearbornville, Mich.
Detroit, Mich.
Fort Brady, Mich.
Fort Gratiot, Mich.
Jefferson Barracks, Mo.
St. Louis Arsenal, Mo.
Fort Constitution, N. H.
Fort Columbus, N. Y.
Fort Hamilton, N. Y.
Fort Wood, Bedloe's Island, N. Y.
Madison Barracks, N. Y.
Plattsburgh, N. Y.
Watertown Arsenal, N. Y.
West Point, N. Y.
Principal Recruiting Depot, N. Y.
Allegheny Arsenal, Pa.
Fort Monroe, Va.
Fort Crawford, Wis.
Fort Howard, Wis.
Fort Winnebago, Wis.

The following stations did not record precipitation depths but only descriptions of weather conditions:

Camp Atkinson.
Forts Econfina, Green, and Murat.
Fort Wayne, Ark.
United States Arsenal, Little Rock, Ark.
Augustine, E. Fla.
Fort Armistead, E. Fla.
Fort Dallas, E. Fla.
Fort Fanning, E. Fla.
Fort Heileman, E. Fla.
Fort King, E. Fla.
Fort Lauderdale, E. Fla.
Fort Micanopy, E. Fla.
Fort New Smyrna, E. Fla.
Fort No. 3, E. Fla.
Fort Pierce, E. Fla.
Fort Shannon, E. Fla.
Fort Wacassassa, E. Fla.
Picolate, E. Fla.
Fort Macomb, Fla.
Fort Barker, W. Fla.
Fort Frank Brooke, W. Fla.
Camp R. Gamble, W. Fla.
Baton Rouge, La.
Fort Niagara, N. Y.
Poinsett Barracks, N. Y.
Rouses Point, N. Y.
Carlisle Barracks, Pa.
Fort Moultrie, S. C.
Jefferson Barracks, N. Y.

1841–77.—Practically all the above-listed stations were maintained, and others were added from year to year.

DATA COLLECTED BY SMITHSONIAN INSTITUTION

Records were collected by the Smithsonian Institution from 1840 to 1873. Data blanks issued in 1840 included a column for recording amount of rain or melted snow, but only descriptions of weather conditions were recorded. The records from 1849 to 1856 have been attacked by termites and also partly destroyed by fire, causing many breaks in the data now available.

Records including precipitation depths are available, beginning with 1843, for the following stations:

Framingham, Mass.
Keene, N. H.
Cincinnati, Ohio.
Columbus, Ohio.
Lebanon, Ohio.
Mifflintown, Pa.
United States Navy Yard, Philadelphia, Pa.
West Chester, Pa.
Grafton, Vt.

By March 1849 the list of stations recording precipitation had increased to include the following:

Monroeville, Ala.
Montgomery, Ala.
Weokaville, Ala.
Laporte, Ind.
Richmond, Ind.
Prospect Hill, Ky.
Battle Creek, Mich.
Detroit, Mich.
Madrid, N. Y.
Oberlin, Ohio.
Canonsburg, Pa.
Easton, Pa.
Freeport, Pa.
Gettysburg, Pa.
Manchester, Pa.
Morrisville, Pa.
Near Lima, Pa.
University of Nashville, Tenn.
Milwaukee, Wis.

1850–51, 1853–54.—Destroyed by fire.

1854–55.—The following stations recorded precipitation as "rain in inches"; others, included in the larger list shown below under

1857–62, continued to record only descriptions of weather and rainfall conditions:

Florence, Ariz.
Fort Apache, Ariz.
Buford, Dakota Terr.
Huron, Dakota Terr.
Stevenson, Dakota Terr.
Cedar Keys, Fla.
Atlanta, Ga.
Boise City, Idaho.
Fort Gibson, Idaho.
Des Moines, Iowa.
Baltimore, Md.
Boston, Mass.
Grand Haven, Mich.
Fort Assinaboine, Mont.
Fort Benton, Mont.
Helena, Mont.
Missoula, Mont.
Shaw, Mont.
Albany, N. Y.
Buffalo, N. Y.
Cleveland, Ohio.
Erie, Pa.
Eagle Pass, Tex.
El Paso, Tex.
Cape Henry, Va.
Dayton, Wyo.
Washakie, Wyo.

1855–56.—These records were practically the same as for the previous year except that the following stations were added:

Campo, Calif.
Fort Bennett, Dakota Terr.
Camp Thomas, Wyo.

1856–57.—A new form was issued listing daily barometric pressure, temperature, relative humidity, wind direction and velocity, and precipitation as rain and melted snow. The records are complete for the stations substantially as listed above.

1857–62.—These records were practically complete for 150 stations including the foregoing and others of less prominence or relatively inferior quality and continuity of records substantially as listed below, distributed throughout the country, using the form issued in 1856. In January 1862 the following stations recorded amount of rain or melted snow:

Greensboro, Ala.
Marysville, Calif.
Sacramento, Calif.
San Benito, Calif.
San Francisco, Calif.
Canton, Conn.
Colebrook, Conn.
Middletown, Conn.
Wallingford, Conn.
Key West, Fla.
Micanopy, Fla.
Augusta, Ill.
Highland, Ill.
Jacksonville, Ill.
Lebanon, Ill.
Manchester, Ill.
Ottawa, Ill.
Peoria, Ill.
Riley, Ill.
Sandwich, Ill.
Winnebago, Ill.
New Harmony, Ind.
Davenport, Iowa.
Dubuque, Iowa.
Fort Madison, Iowa (near).
Iowa City, Iowa.
Lyons, Iowa.
Muscatine, Iowa.
Pleasant Plain, Iowa.
Sioux City, Iowa.
Ballardsville, Ky.
Danville, Ky.
Louisville, Ky.
Millersburg, Ky.
Nicholasville, Ky.
Springdale, Ky.
Bethel, Maine.
Bucksport, Maine.
Cornish, Maine.
Cornishville, Maine.

Dexter, Maine.
Fryeburg, Maine.
Gardiner, Maine.
Lisboro, Maine.
Perry, Maine.
Steuben, Maine.
Windham, Maine.
Agricultural College, Md.
Annapolis, Md.
Chestertown, Md.
Frederick City, Md.
Neitersburg, Md. (near).
St. Mayo City, Md.
Schellman Hills, Md.
Amherst, Mass.
East Douglas, Mass.
Lawrence, Mass.
Lynn, Mass.
New Bedford, Mass.
Richmond, Mass.
Topsfield, Mass.
Westfield, Mass.
Williamstown, Mass.
Worcester, Mass.
Marquette, Mich.
Cooper, Mich.
Detroit, Mich.
Holland, Mich.
New Buffalo, Mich.
Monroe, Mich.
Haglewood, Minn.
Paris, Mo. (near).
St. Louis, Mo.
St. Louis, Mo. (near).
Bellevue, Nebr.
Clarimont, N. H.
Concord, N. H.
Londonderry, N. H.
Portsmouth, N. H.
Shelburne, N. H.
Streafford, N. H.
Bloomfield, N. J.
Burlington College, N. J.
Middletown, N. J.
Newark, N. J.
Bellport, N. Y.
Buffalo, N. Y.
Clarenovia, N. Y.
Fishkill Landing, N. Y.
Erasmus Hall, Kings County, N. Y.
Heresa, N. Y.
Hermitage, N. Y.
Houseville, N. Y.
Mosley, N. Y.
New York, N. Y.
Oswego, N. Y.
Poughkeepsie, N. Y.
Rochester, N. Y.
Rouses Point, N. Y.
Sag Harbor, Long Island, N. Y.
Troy, N. Y.
Wampsville, N. Y.
Waterford, N. Y.
Bowling Green, Ohio.
Cincinnati, Ohio.
Cleveland, Ohio.
Coshocton, Ohio.
East Cleveland, Ohio.
Halcyon Academy, Licking County, Ohio.
Hudson, Ohio.
Kelleys Island, Ohio.
Madison, Ohio.
Marietta, Ohio.
Montville, Ohio.
New Lisboro, Ohio.
North Bend, Ohio.
Norwalk, Ohio.
Savannah, Ohio.
Toledo, Ohio.
Troy, Ohio.
Urbana University, Ohio.
Welchfield, Ohio.
Westerville, Ohio.
Blairsville, Pa.
Canonsburg, Pa.
Fleming, Pa.
Gettysburg, Pa.
Harrisburg, Pa.
McKean County, Pa.
Morrisville, Pa. (near).
Nazareth, Pa.
Norristown, Pa.
Philadelphia, Pa.
Pocopson, Pa.
Ryberry, Pa.
Shamokin, Pa.
Worthington, Pa. (near).
Providence, R. I.
Austin, Tex.
Brandon, Vt.
Brattleboro, Vt.
Burlington, Vt.
Craftsbury, Vt.
Springfield, Vt.
Milwaukee, Wis.
Odanak, Wis.
Rocky Rim, Wis.

RECORDS OF SIGNAL SERVICE, UNITED STATES ARMY

Records from 1871 to 1879 are much broken, owing to loss of certain portions in the Boston fire.

1870–72.—Records were reported on weekly forms, and station reports were bound in separate volumes. The record for Boston begins with the week of November 6, 1870. Precipitation was recorded in columns for amount of either rain or melted snow. The station at Davenport, Iowa, was initially listed for the week beginning May 28, 1871, and the record for Breckenridge, Minn., began April 2, 1872.

1875.—In addition to observations at the foregoing stations, records for Augusta, Ga., began January 2, 1875, listing depths of rain or melted snow. Records for Baltimore, Md., Cape Henry, Va., and Bismarck, N. Dak., began January 3, 1875.

1879–80.—In addition to observations at the foregoing stations, records were initiated for Brackettville, Tex., and Cairo, Ill., January 4, 1880.

1880–87.—New forms were introduced, listing in separate columns barometric pressure, temperature, relative humidity, wind, and precipitation depths either as rain or as melted snow. These forms were used until 1887. The records are practically complete.

The following stations were operated from 1880 to 1887:

Albany, N. Y.
Alpena, Mich.
Atlanta, Ga.
Atlantic City, N. J.
Augusta, Ga.
Baltimore, Md.
Barbaclos, Wash.
Barnegat, N. J.
Bismarck, N. Dak.
Boise City, Idaho.
Boston, Mass.
Brownsville, Tex.
Buffalo, N. Y.
Buford, N. Dak.
Burlington, Vt.
Cairo, Ill.
Campo, Calif.
Camp Thomas, Wyo.
Cape Henry, Va.
Cape May, N. J.
Castroville, Tex.
Cedar Keys, Fla.
Champaign, Ill.
Charleston, S. C.
Charlotte, N. C.
Chattanooga, Tenn.
Cheyenne, Wyo.
Chicago, Ill.
Chincoteague, Va.
Cincinnati, Ohio.
Cleveland, Ohio.
Coleman City, Tex.
Columbus, Ohio.
Concho, Tex.
Davenport, Iowa.
Dayton, Wash.
Deadwood, S. Dak.
Decatur, Tex.
Delaware Breakwater, Del.
Denison, Tex.
Denver, Colo.
Des Moines, Iowa.
Detroit, Mich.
Dodge City, Kans.
Dubuque, Iowa.
Eagle Pass, Tex.
Eagle Ranch, Idaho.
Eastport, Maine.
El Paso, Tex.
Erie, Pa.
Escanaba, Mich.
Florence, Ariz.
Fort Apache, Ariz.
Fort Assinaboine, Mont.

Fort Bennett, S. Dak.
Fort Benton, Mont.
Fort Custer, Mont.
Fort Davis, Tex.
Fort Elliott, Tex.
Fort Gibson, Okla.
Fort Grant, Ariz.
Fort Griffin, Tex.
Fort Keogh, Mont.
Fort Macon, N. C.
Fort Sill, Okla.
Fort Stevenson, N. Dak.
Fort Verde, Ariz.
Fredericksburg, Tex.
Galveston, Tex.
Grand Haven, Mich.
Hatteras, N. C.
Habana, Cuba.
Helena, Mont.
Henrietta, Tex.
Huron, S. Dak.
Indianapolis, Ind.
Key West, Fla.
McKarest, Tex.
Missoula, Mont.
Shaw, Mont.
Washakie, Wyo.

1887–88.—A new form was issued listing in separate columns daily barometric pressure, temperature, relative humidity, wind direction and velocity, clouds, and precipitation depths either as rain or as melted snow. The records are practically complete. The number of stations increased to about 150, widely distributed throughout the country, and including the foregoing 80 stations.

1889–95.—With only minor additions, the list of active stations continued until taken over by the newly established United States Weather Bureau about 1895.

VOLUNTARY OBSERVERS' METEOROLOGIC REPORTS

Considerable variety in quality and legibility is shown in the records collected by voluntary observers, beginning about 1865.

In 1892 these stations, numbering 52 and widely distributed throughout the country, began using a form listing in separate columns wind direction and velocity, barometric pressure, and precipitation depths shown either as rain or as melted snow. The records were practically complete, even during early years. These stations were so located as to supplement the more important stations of the United States Weather Bureau.

For later records it is noted that 127 stations were listed in 1903 in the following States:

Alabama.
California.
Colorado.
Connecticut.
The Dakotas.
Delaware.
Florida.
Georgia.
Idaho.
Illinois.
Maine.
Maryland.
Michigan.
Minnesota.
Nebraska.
New Jersey.
North Carolina.
Oregon.
South Carolina.
Tennessee.
Texas.
Vermont.
Virginia.
Washington.
Wisconsin.
Wyoming.
New Hampshire.

In 1912 a new form was issued, listing in separate columns precipitation depths either as rain or as melted snow, wind direction and velocity, barometric pressure, clouds, humidity, and river observations, mainly with reference to stream stages.

RECORDS COLLECTED BY VARIOUS AGENCIES AND STORED AT SMITHSONIAN INSTITUTION

One of the most interesting discoveries resulting from this investigation comprised 54 packages of miscellaneous hydrologic data stored in the attic of the Smithsonian Institution, to which they had been transferred from the Weather Bureau vaults some 20 years ago to make room for more recent acquisitions. The character of the material within these packages had been disclosed apparently by sampling, but no comprehensive inventory was available. From a casual inspection of a few packages selected at random, it was found that the contents ranged from daily weather charts and bulletins to digests of observations relating to halos, parhelia, meteors, aurora borealis, magnetic dip and declination, eclipses, earthquakes, times of blossoming and fruiting of various plants and trees, and dates of migrations of birds.

Among the voluminous meteorologic correspondence, news clippings, and observed data were found some volumes, carefully bound and indexed and thoroughly deserving of shelf room in a reference library.

Among the most outstanding values are those of package 15, containing among other records an original script summary covering mean temperatures by months, seasons, and years between 1760 and 1854 for nearly 1,000 stations on the American continent—mostly broken records and naturally pertaining mainly to the later years, but nevertheless summarizing all available data up to and including the year 1854.

Another package, No. 45, contains an orderly, well-written script summary of precipitation by months and years at about 2,000 stations, over 1,800 of which are located in the United States. The distribution among the States is as shown in the following table, in which fractional years are counted as years of record.

State	Number of stations	Station-years	State	Number of stations	Station-years
Alabama	30	157	Missouri	44	227
Alaska	8	43	Montana	14	57
Arizona	25	109	Nebraska	29	124
Arkansas	13	79	Nevada	6	38
California	61	381	New Hampshire	30	163
Colorado	18	85	New Jersey	36	223
Connecticut	21	156	New Mexico	25	209
Dakota	21	120	New York	145	1,208
Delaware	6	30	North Carolina	40	150
District of Columbia	1	41	Ohio	112	735
Florida	37	244	Oregon	27	153
Georgia	34	164	Pennsylvania	116	779
Idaho	4	30	Rhode Island	3	58
Illinois	78	467	South Carolina	20	165
Indian Territory	7	90	Tennessee	28	138
Indiana	45	240	Texas	101	455
Iowa	67	377	Utah	8	55
Kansas	54	292	Vermont	25	182
Kentucky	23	151	Virginia	54	265
Louisiana	14	101	Washington	18	121
Maine	58	352	West Virginia	18	75
Maryland	29	214	Wisconsin	52	300
Massachusetts	58	619	Wyoming	15	84
Michigan	56	362			
Minnesota	42	232	Total	1,802	11,243
Mississippi	26	143			

Stations in these Provinces recorded monthly averages:

	Number of stations	Station-years		Number of stations	Station-years
British North America	8	47	Ontario	67	278
Newfoundland	6	40	Manitoba	3	13
Nova Scotia	22	128	British Columbia	2	8
Prince Edward Island	2	7			
New Brunswick	14	57	Total	147	610
Quebec	23	132			

From these tables it appears that nearly 12,000 station-years are included for about 2,000 stations, giving about 6 years as the average length of record.

The volume of hydrologic data assembled and published by C. A. Schott in 1881 rendered these records available in a summarized form as monthly and yearly means. The following explanation is quoted from Schott's "Introduction to rainfall tables":

> The first work, after collecting the material, was to form tables giving the summary of monthly amourts of rainfall, arranged for each State and Territory separately for each year. These tables served as the basis from which most of the deductions given in this memoir are derived; but, on account of their voluminous character and consequent great expense of printing, they are not published at present. They can be referred to, however, at the Institution.

Although Schott's condensed rendering accomplished the objective of reducing the volume and expense of publication, it did not carry forward the month-by-month and year-by-year precipitation observations. However, much of this material has been included in Weather Bureau Bulletin W by successive months and years of record.

In order to ascertain the proportion of these records still unpublished in 1937, several tests were made, with results as shown in the following table:

Examples of proportion of published and unpublished hydrologic data underlying the C. A. Schott volume of 1881

[Station-years represent the net periods of actual record]

State	Stations listed by C. A. Schott		Stations included in U. S. Weather Bureau Bulletin W, 1930	Unpublished by 1937	
	Number of stations	Station-years		Number of stations	Station-years
Colorado	18	51	8	10	22
Indiana	46	170	17	29	60
Kansas	54	218	13	41	106
Louisiana	19	115	3	16	63
Mississippi	27	108	9	18	32
New York	183	1,554	76	107	336
Wisconsin	51	217	5	46	134
Total	398	2,433	131	267	753
Percentage of total	100	100	32.9	67.1	30.9

It is evident that many short records are included among those remaining unpublished. Furthermore, it should be understood that some fragmentary data have been excluded from Weather Bureau Bulletin W, no doubt justifiably, because of their intermittent or seasonal character. A notable example is the record at Morrisville, Pa., beginning in 1790 and extending through the fall months to 1825, whereas the record in Bulletin W for Morrisville by months throughout the year begins in 1825, and that for Philadelphia in 1820, both neglecting all antecedent data. It appears that space should be accorded for those early observations such as are included in the accompanying table for Morrisville. Even a broken or seasonal record year after year may be susceptible of fairly satisfactory use; it surely represents some value.

Unpublished precipitation data for Morrisville, Pa., 1790–1825

Year	Precipitation (inches)				Year	Precipitation (inches)			
	September	October	November	December		September	October	November	December
1790	-------	4.00	6.00	2.00	1809	2.75	6.25	6.00	2.00
1791	-------	3.50	4.00	4.00	1810	3.50	4.00	5.00	-------
1792	-------	2.75	5.00	-------	1811	-------	3.50	6.00	-------
1793	-------	2.00	4.50	2.00	1812	-------	3.00	3.25	-------
1794	-------	4.50	5.00	-------	1813	4.00	6.00	5.00	-------
1795	-------	3.50	5.00	-------	1814	3.25	4.00	4.00	-------
1796	-------	4.00	3.50	-------	1815	5.00	3.00	6.00	-------
1797	-------	3.00	4.50	-------	1816	5.00	2.50	6.00	3.00
1798	-------	6.00	6.50	-------	1817	3.00	4.00	5.50	-------
1799	-------	6.50	6.00	-------	1818	3.50	3.50	6.50	2.00
1800	-------	7.00	5.00	-------	1819	3.00	2.00	2.50	-------
1801	-------	3.00	7.00	-------	1820	4.50	2.75	5.00	-------
1802	-------	4.50	3.50	-------	1821	4.00	3.00	4.00	-------
1803	-------	3.75	4.50	-------	1822	3.00	5.00	4.50	2.00
1804	-------	6.50	5.50	-------	1823	4.25	3.25	6.00	-------
1805	4.00	5.50	9.00	-------	1824	5.00	3.00	6.00	-------
1806	5.25	4.00	5.00	3.00	Average	4.01	4.02	5.08	2.55
1807	3.75	3.00	4.00	3.00	1825[1]	2.50	1.25	1.50	3.50
1808	5.50	5.00	3.00	2.50	Average	3.93	3.94	4.98	2.64

[1] Monthly precipitation coincides with that given in U. S. Weather Bureau Bulletin W for first year of record for Morrisville, Pa.

Similarly, it seems advisable to publish even the short and fragmentary records of those early periods; they afford valuable clues which may release other data for use in extrapolation or interpolation of records.

Examples of unpublished precipitation data in package 45, attic of Smithsonian Institution

Argyle, N. Y.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1864				4.23	2.53	1.04	2.95	6.69					
1871	1.68		4.64	2.47	2.02	3.43	5.19	5.70	0.97	3.38	2.65	2.65	36.76
1872	.94	1.40	3.00	2.39	2.25	4.81	2.70	7.61	2.23	3.90	*4.20*	*3.23*	*38.66*
1873	*2.73*	*1.43*	*2.67*	*3.05*	*1.95*	*1.06*	*5.85*	*5.73*	*4.42*	*7.01*	3.28	1.19	40.35
1874	4.60	3.12	2.10	4.00	3.10	3.56	5.97	1.00	3.60	1.48	2.50	1.28	36.31

Fort Hamilton, N. Y.

1839	1.80	2.72	1.90	3.34	6.22	6.41	2.80	5.33	4.74	2.35	4.80	8.70	51.11
1840	*2.50*	*2.80*		*4.85*	*3.38*	*5.11*	*4.55*	*6.20*	*1.72*				
1843	*.70*	*1.90*	*4.20*	*5.70*	*1.32*	*1.67*	*1.88*	*14.05*	*3.75*	*4.10*	*1.70*	*3.21*	*44.18*

Wampsville or Oneida, N. Y.

1856			2.50				2.48	10.51	8.57	2.37	3.99		
1857					6.27		6.08	14.31			2.88		
1858				8.61	7.94		7.28						
1859	7.17			10.42	5.57	5.10	8.92	5.83	8.65	3.39		4.67	72.62
1860		2.00	2.72	3.76	6.59	7.86	9.57	5.60	7.17	6.92	9.91		69.97
1861	3.20	2.47	5.27	7.34	7.13	1.90	16.82	5.20	8.48	10.91	2.72	2.09	73.53
1862	*2.70*	*3.85*	*2.80*	*2.65*	*8.74*	*7.45*	*6.69*	*6.60*	*2.84*	*8.34*	*7.42*	*3.75*	*63.71*
1863		4.25	3.70	3.53	4.80	3.87	8.11	12.73	4.86	6.44	6.88	3.59	66.82
1864	4.83	1.10	5.12	4.29	5.09	2.08	2.84	12.53	5.87	7.11	5.93	4.16	60.95
1865	3.80	3.36	3.96	6.26	5.01	5.58	6.11	1.68	9.22	7.85	6.29	5.87	64.99
1866	1.60	5.26	4.17	1.72	4.37	11.38	5.86	6.60	9.08	3.08	7.31	3.79	64.22

All records in italic figures are in U. S. Weather Bureau Bulletin W, 1930.

The general character of the materials included among the unpublished hydrologic data in the attic of the Smithsonian Institution is shown in the following table, together with the earliest and latest years of record. Among the notable classifications are important meteorologic or hydrologic data from 1760 to 1879; meteorologic correspondence, 1846 to 1867; news clippings, 1840 to 1891; daily or other periodic weather bulletins or weather charts, 1801 to 1891; diaries, 1822 to 1868; and miscellaneous technical writings related to meteorology, 1646 to 1891. Of these, the earliest records, beginning with 1646 and extending to 1860, had to do with the dates of frost and opening of the Hudson River in Albany, N. Y.

General classification of packages of unpublished hydrologic data in attic of Smithsonian Institution

[The first number in each item is the number of the package]

Important meteorologic or hydrologic data	Fragmentary meteorologic or hydrologic data	Meteorologic correspondence	Daily or other periodic weather bulletins or weather charts	News clippings	Miscellaneous correspondence	Miscellaneous charts	Miscellaneous technical writings related to meteorology, etc.	Diaries
15 (1,000 stations, 1760–1854). 23 (up to 1854). 28 (up to 1859). 35 (1790–1874). 38 (1816–73). 41 (1844–73). 43 (1882–84). 45 (2,000 stations, 1799–1879). 48 (1738–1873). 54 (450 stations, 1820–74).	1 (1874–77). 2 (1830–74). 3 (1832–80). 4 (1846–79). 5 (1853–71). 6 (1801–76). 7 (1818–63). 10 (1848–90). 15 (1789–1857). 20 (1837–75). 32 (1849–75). 33 (1850–67). 37 (1787–1872). 38 (1812–72). 40 (1820–73). 41 (1823–73). 46 (1855–73). 50 (1821–68). 53 (1821–73).	7 (1850–54, 1856–63). 8 (1857–66). 13 (1846–59). 14 (1849–53). 31 (1861–63). 36 (1850–67). 39 (1841–66).	6 (1801–77). 12 (1843–91). 16 (1885–90). 17 (1884–91). 18 (1884–90). 19 (1889–90). 21 (1885–91). 22 (Atlantic cable, 1865–66). 24 (1880–82). 26 (1889–90). 30 (1861–81). 33 (1872–76). 34 (1852).	2 (1857–91). 4 (1864–72). 10 (1882–90). 12 (1864). 20 (1861–74). 27 (1865–71). 31 (1840–72). 39 (1861–72). 41 (1859–73).	4 (1808–81).	39 (1869–70). 42 (1855–71). 45 (1855–59). 46 (1843). 53 (1867–68).	9 (1871–81). 13 (1846–59). 14 (1849–59). 25 (1646–60). 29 (1849–74). 40 (1820–73). 41 (1823–75). 42 (1819–73). 44 (1850–76). 47 (1849–91). 48 (1738–1873). 49 (1870–90). 51 (1885). 52 (1865–72).	11 (1840–68). 39 (1841–57). 50 (1822–68).

In order to show more in detail the nature of the meteorologic data in this collection, the following notes were made concerning package 45 and some other sample packages selected at random.

Tables showing monthly summaries of the amount of precipitation for each month and year for 2,000 stations in the United States and some other countries of North, Central, and South America, for short periods near the middle of the nineteenth century.

Tables showing the number of rainy and snowy days during each month and year for the following stations:

Cleveland, Ohio, 1860–63 and 1866.
Charlotte, N. Y., 1859–63 and 1866.
Sacketts Harbor, N. Y., 1859–63 and 1866.
Fort Niagara, N. Y., 1859–63 and 1866.
Buffalo, N. Y., 1860–63 and 1866.
Ottawa Point, Mich., 1858–63 and 1866.
Thunder Bay Island, Mich., 1858–63.
Superior City, Wis., 1859–63 and 1866.
Brunswick, Maine, 1807–59.
Fort Snelling, Minn., 1822–58.
Fort Columbus, N. Y., 1822–59.
Philadelphia, Pa., 1851–68.
Fort Brady, Mich., 1823–56.
Fort Moultrie, S. C., 1823–59.
Fort Mackinac, Mich., 1826–31 and 1859.
Fortress Monroe, Va., 1826–59.
Fort Leavenworth, Kans., 1831–59.

Hiram, Maine: The yearly average of mean temperature from 1831–64; also, the amount of snow.

Lisbon Factory, Androscoggin County, Maine: Barometer and thermometer readings for 1867.

Castine, Hancock County, Maine: An abstract of a meteorologic register showing the maximum and minimum temperature of every month from 1810 to 1850.

Saco, Maine: Monthly summaries of rain in inches for 1844, 1845, and 1846.

Annapolis, Md.: Maximum and minimum temperature for 1856.

Barometer readings were recorded for the following stations in 1859:

Ohio:
- Avon.
- Bowling Green.
- Cincinnati.
- Hillsborough.
- Hudson.
- College Hill.

Missouri:
- St. Louis.

Massachusetts:
- Amherst.
- Lawrence.
- Nantucket.
- Westfield.
- Cambridge.

Vermont:
- Burlington.
- St. Johnsbury.

Illinois:
- Batavia.
- Manchester.
- Marengo.
- Lebanon.
- Elgin.

Iowa:
- Dubuque.
- Fairfield.

Pennsylvania:
- Gettysburg.
- Harrisburg.
- Norristown.
- Mount Joy.

Indiana:
- Aurora.
- Cannelton.
- Michigan City.
- New Harmony.

New Jersey:
- Newark.
- Lambertville.

Wisconsin:
- Appleton.
- Beloit.
- Delafield.
- Milwaukee.

New Hampshire:
- Claremont.
- Shelburne.

Thermometer readings were recorded for the following stations in 1859:

Pennsylvania:
- Bellefonte.
- Berwick.
- Canonsburg.
- Norrisville.

Virginia:
- Hartwood.
- Levinsville.
- Lewisburg.

Maryland:
- Baltimore.
- Frederick.

Iowa:
- Bellevue.
- Fort Madison.
- Rossville.
- Burlington.

Georgia:
- Athens.
- Augusta.
- Thomaston.

New York:
- Bellport.
- Beverly.
- Nichols.
- Waterford.

Kentucky:
- Bardstown.
- Danville.
- Springdale.
- Paris.

Connecticut:
- Columbia.
- Wallingford.
- New Haven.

New Jersey:
- Freehold.
- Newark.

Monthly totals of precipitation for the following stations not included in Weather Bureau Bulletin W:

Alabama:
- Carlowville, 1856–60, 1867–74.
- Catopa, 1870–71.
- Elyton, 1870–71.
- Fish River, 1867–71.
- Florence, 1849.
- Fort Mitchell, 1836–37.
- Moulton, 1859, 1861, 1866–69, 1871–74.

Arizona:
- Camp Goodwin, 1866–70.
- Camp Grant, 1866–74.
- Camp McDowell, 1866–74.
- Camp Whipple, 1865–74.

Arkansas:
- Fort Smith, 1837–61, 1870–71.
- Washington, 1840–61, 1867, 1870–72.

California:
- Alcatraz Island, 1862–74.
- Benicia Barracks, 1849–65, 1870–74.
- Camp Wright, 1864–74.
- Fort Crook, 1858–69.
- Fort Humboldt, 1854–66.
- Fort Jones, 1853–58.
- Fort Point, 1860–74.
- Fort Yuma, 1851–59, 1866–74.

Colorado:
- Denver, 1869–71.

Connecticut:
- Fort Trumbull, 1843–46, 1864–74.
- Pomfret, 1854–69.

Dakota:
- Fort Randall, 1857–74.

District of Columbia:
- Washington, 1836–38, 1840, 1842.

Florida:
- Fort Brooke, 1840–58.
- St. Augustine, 1844.

Georgia:
- Savannah, 1836, 1838–39.
- Whitemarsh Island, 1849–61.

Illinois:
- Augusta, 1856–74.
- Chicago, 1844, 1856, 1857, 1862, 1867–70.
- Manchester, 1854–74.
- Marengo, 1850–53.
- Riley, 1856–74.
- Sandwich, 1859–74.
- Wayanet, 1864–74.

Iowa:
- Davenport, 1861–70.
- Fort Madison, 1848–74.

Kansas:
- Fort Riley, 1853–74.

Kentucky:
- Childburg, 1858–74.
- Newport Barracks, 1855–59, 1864–74.

Louisiana:
- Baton Rouge, 1846.

Maine:
- Cornish, 1856.
- Steuben, 1854–59, 1861–70.

Maryland:
- Fort McHenry, 1836–59, 1864–74.

Massachusetts:
- Cambridge, 1841–67.
- Lunenburg, 1841–74.

The following tables are examples of precipitation records:

Sample precipitation records

Wayanet, Ill.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1864	------	------	------	------	------	------	------	1.75	3.16	3.16	2.98	3.89	------
1865	0.26	3.40	3.12	6.14	1.57	4.47	6.96	8.79	11.57	2.90	.28	.54	50.00
1866	1.92	2.02	2.38	1.90	1.90	2.80	4.19	5.44	6.79	1.66	.26	3.06	34.32
1867	1.76	1.27	2.06	2.00	6.62	3.30	1.95	2.48	1.36	.97	2.40	1.50	27.67
1868	.48	.97	5.15	------	------	2.41	2.03	2.08	4.61	1.24	3.57	1.21	31.72
1869	1.95	2.47	1.14	3.40	7.78	9.96	6.86	9.39	.67	.81	3.88	3.02	51.31
1870	4.15	.70	5.50	.60	1.42	.70	1.91	------	6.64	3.62	1.84	1.52	33.45
1871	3.32	2.00	2.72	2.83	2.35	5.90	1.85	------	------	------	3.45	3.47	39.68
1872	.18	.75	2.96	5.91	6.56	6.31	4.05	9.21	6.33	.92	1.59	1.28	46.05
1873	4.55	1.06	1.39	6.75	7.25	2.65	5.65	1.32	1.83	2.23	1.40	3.87	39.95
1874	3.05	1.29	1.81	3.27	3.48	4.56	1.78	3.56	5.14	3.40	2.94	.74	35.02

Chicago, Ill.

1844	------	------	1.76	2.76	3.45	------	------	------	------	------	------	------	------
1856	------	------	------	------	------	------	------	------	------	------	3.98	3.86	------
1857	1.09	5.43	2.55	2.19	6.33	4.14	------	------	------	------	------	------	------
1862	------	------	------	------	------	------	------	------	------	2.92	------	------	------
1867	1.93	2.22	1.58	1.70	4.42	1.86	1.52	2.33	0.57	1.28	1.89	1.11	22.41
1868	1.28	.92	5.24	3.00	3.74	3.11	2.87	3.55	7.08	1.69	2.60	1.40	36.48
1869	1.97	2.23	1.33	4.30	5.69	5.03	3.26	1.32	.89	1.10	2.42	2.03	31.57
1870	1.95	.86	1.81	1.15	.80	1.70	3.71	2.07	2.82	2.43	1.16	2.46	22.92

NOTE.—The record in U. S. Weather Bureau Bulletin W for Chicago begins in 1871; the above table affords a valuable extension of precipitation data. The rainfall records for Wayanet do not appear in Bulletin W.

SUMMARY OF UNPUBLISHED HYDROLOGIC DATA

The following table summarizes the results of the inventory.

Probably the most significant data listed in this table are classified under "Precipitation" and "Stream-gaging stations," including 2,869 and 1,063 separate stations, respectively, and 20,070 and 15,023 station-years of record. In comparison with these figures, those listed for "ground-water observation wells" appear disproportionately large—12,125 and 134,134. This results from listing each separate well as a station, although as a matter of practice, it often requires several observation wells, usually 10 or more, to establish reliable averages for ground-water fluctuations in a locality; and therefore several wells are observed from a single station.

Many "snow-measurement stations" cover courses along which numerous observations are made in order to determine representative average depths and water equivalents for the basin or locality.

It is not to be assumed that all the record periods were completely covered among either the early or the recent records. Frequent breaks of a month or more, and occasional breaks in the record amounting to years, are encountered throughout most of the early records. On this account the totals of both station-years and stations are subject to drastic reduction for practical purposes in connection with plans for publication.

Summary of unpublished hydrologic data located during investigations of Subcommittee on Small Water-Storage Projects, August 1936 to March 1937

State	Precipitation stations			Meteorologic central stations			Anemometer and wind vane stations			Standard U. S. Weather Bureau class A evaporation pans			Nonstandard evaporation pans			Snow-measurement stations		
	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record
Alabama	1	5	5				3	3	1									
Arizona	71	642	36	2	8	6	3	31	17	3	37	25	2	19	18	3	26	17
Arkansas	33	186	8				3	15	7							1	7	7
California	1,350	10,845	61	14	63	10	32	203	16	9	65	11	141	313	15	205	2,439	27
Colorado	26	26	1	1	1	1	4	37	17				2	26	13	35	74	18
Connecticut	18	241	77															
Delaware																		
District of Columbia																		
Florida	31	308	19	2	6	4	5	40	8				1	2	2			
Georgia	6	12	2															
Idaho	104	953	28	9	156	38	11	76	38	1	21	21	2			279	5,594	46
Illinois	62	332	11	1	1	1	2	11	10									
Indiana	6	18	8				2	2	1									
Iowa	28	110	16	1	22	22										1	1	1
Kansas	18	181	38										2	42	28	3	6	2
Kentucky																		
Louisiana	11	63	19	1	2	2	3	5	2	1	4	4						
Maine																		
Maryland																101	608	8
Massachusetts	4	110	52	1	52	52	2	102	51				1	51	51	1	52	52
Michigan	9	63	20				3	3	1							11	11	1
Minnesota	46	63	18				1	18	18							30	240	8
Mississippi	5	13	6				7	8	2							2	4	2
Missouri	18	166	26	1	26	26	3	53	26							23	67	3
Montana	168	1,518	47	2	13	8	8	58	25							133	2,718	47
Nevada	2	3	2							2	14	13				69	1,263	27
New Hampshire	8	36	7															
New Jersey	6	117	45													1	45	45
New Mexico	20	286	35				1	7	7				1	7	7	2	4	2
New York	4	50	22													1	22	22
North Carolina	83	299	21													75	225	3
North Dakota	1	5	1				1	5	5									
Ohio	50	320	20													15	15	1
Oklahoma	161	235	44	10	10	1				1	6	6				1	6	6
Oregon	177	1,272	46	2	4	3	87	532	13				3	25	15	145	1,310	24

State	Ground-water observation wells			Lake and reservoir stations			Stream-gaging stations			Miscellaneous stations			Total (or maximum)		
	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record
Alabama							17	714	42	3	5	3	24	727	42
Arizona	916	15,586	25	17	94	25	12	122	50	14	94	26	1,043	16,659	50
Arkansas	4	4	1	2	2	1	33	389	32	8	42	7	84	645	32
California	9,013	109,910	14	156	2,780	30	416	4,567	16	26	127	20	11,362	131,312	61
Colorado				44	660	15	23	258	12	6	102	17	141	1,184	3
Connecticut													18	241	77
Delaware															
District of Columbia															
Florida	272	1,273	5	40	200	5	4	72	18	1	2	2	356	1,903	19
Georgia				7	21	3	12	50	12	3	6	2	28	89	12
Idaho				9	176	27	43	586	27	16	107	22	474	7,669	46
Illinois	369	726	7	8	99	24	28	450	59	2	3	2	472	1,622	59
Indiana	161	1,122	7				3	12	9				172	1,154	9
Iowa	47	235	5	2	48	24	15	284	59				94	700	59
Kansas	9	17	6	4	20	5				8	126	28	44	392	38
Kentucky							30	697	43				30	697	43
Louisiana							42	236	24	3	3	1	61	313	24
Maine							4	96	24				4	96	24
Maryland													101	608	8
Massachusetts													9	367	52
Michigan	451	1,253	3				2	17	11	18	47	10	494	1,394	20
Minnesota	176	1,005	11	1	8	8	4	17	7				258	1,351	18
Mississippi	76	248	7				23	183	27	5	15	5	118	471	27
Pennsylvania	20	55	11	1	11	11	1	10	10				85	101	2
South Carolina	7	29	23	1	9	9									
South Dakota	3	82	29												
Tennessee	2	5	3												
Texas	84	617	48	18	270	48	153	153	1				23	285	48
Utah	73	127	42	6	86	21	1	2	2	1	17	17	198	843	7
Virginia	1	8	8												
Washington	114	572	12	5	45	9	75	311	10				38	307	11
West Virginia	6	20	6												
Wisconsin	31	71	5	6	18	6	2	5	4						
Wyoming	1	6	6										9	162	18
Total	2,869	20,070		84	803		413	1,690		18	164		1,490	16,435	
Maximum record period			61			52			51			25			51			52
Average years of record per station			7.0			9.5			4.1			9.1			3.1			11.0

Summary of unpublished hydrologic data located during investigations of Subcommittee on Small Water-Storage Projects, August 1936 to March 1937—Continued

State	Ground-water observation wells			Lake and reservoir stations			Stream-gaging stations			Miscellaneous stations			Total (or maximum)		
	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record	Stations	Station years	Years of maximum record
Missouri	79	158	2				35	744	59	2	2	1	161	1,216	59
Montana				2	49	28				13	83	20	326	4,439	47
Nevada	14	28	2	1	1	1	6	81	29				94	1,390	29
New Hampshire													8	36	7
New Jersey				4	50	16	7	55	16	2	3	2	20	270	45
New Mexico				2	60	30				2	30	22	28	394	35
New York	3	66	22										8	138	22
North Carolina	19	28	2				34	102	3				211	654	21
North Dakota	10	40	5							1	5	1	13	55	5
Ohio							68	1,059	62				133	1,394	62
Oklahoma													173	257	44
Oregon	267	884	6	3	52	27	6	83	23	11	71	13	701	4,233	46
Pennsylvania				1	10	10	27	602	39	2	8	4	137	797	39
South Carolina										1	1	1	9	39	23
South Dakota				1	15	15							4	97	29
Tennessee							1	1	1				3	6	3
Texas							4	12	3				282	1,337	48
Utah	5	25	5	1	24	24	53	160	3	9	24	5	347	1,308	42
Virginia													1	8	8
Washington	206	1,442	7	4	89	26	80	2,676	41	4	29	12	526	5,471	41
West Virginia							27	667	62				33	687	62
Wisconsin	28	84	3				3	13	7	11	23	3	81	214	7
Wyoming				2	32	24	1	18	18				13	218	24
Total	12,125	134,134		311	4,490		1,063	15,023		171	958		18,699	194,252	
Maximum record period			25			30			62			28			77
Average years of record per station			11.1			14.4			14.1			5.6			10.4

A number of contributions of unpublished hydrologic data were collected during the course of correspondence with various agencies and are to be found in the files; and others, not listed nor classified in the tabulations, include in pamphlet form such matters as meteorologic records of Morris Reservoir, San Gabriel Canyon, Calif., 1930–36; unpublished hydrographic records of Oregon, up to March 2, 1937; and copy of the diary of Rapin Andrews, 1837–74, Perry Township, Allen County, Ind., all worthy of further consideration.

COMPARISON OF PRECIPITATION RECORDS

The following comparison of precipitation records for 1838 illustrates both the similarities and the divergencies in the records and also the use of fragmentary records:

Precipitation, in inches, at certain stations, 1838

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Washington, D. C. (from both Smithsonian Institution records and U. S. Weather Bureau Bulletin W. 2d ed.)	-----	-----	-----	-----	-----	-----	3.08	0.92	8.29	3.96	3.41	1.70	35.10
Philadelphia, Pa. (from U. S. Weather Bureau Bulletin W, 1930)	2.20	2.19	3.17	3.59	3.58	6.60	2.38	2.78	9.52	4.90	3.35	1.05	45.31
Baltimore, Md., adopted also for Washington, D. C., in recent editions of U. S. Weather Bureau Bulletin W	2.10	2.90	4.50	2.80	4.30	4.70	1.90	9.10	4.50	3.10	2.70	4.50	47.10
Fort McHenry, Baltimore, Md., from Surgeon General's records	4.20	5.50	5.00	6.20	8.80	8.80	4.00	1.70	9.00	6.20	6.70	3.20	69.30
Total	8.50	10.59	12.67	12.59	16.68	20.10	11.36	14.50	31.31	18.16	16.16	10.45	196.81
Mean	2.83	3.53	4.22	4.20	5.56	6.70	2.84	3.62	7.83	4.54	4.04	2.61	49.20

NOTE.—In view of the close association and similarity of precipitation records in Philadelphia, Baltimore, and Washington (those covering the period 1817–51 for Washington having been derived mainly from those for Baltimore, part of which in turn were interpolated from Philadelphia data), it seems appropriate to compare all basic data, however fragmentary, from those three stations. It appears to be more than a coincidence that the Baltimore monthly totals in the foregoing tabulation for January, September, and October are exactly half of those recorded for Fort McHenry, and that nearly the same relation exists for the monthly totals of February, April, May, June, and July. In view of all the data and their established interrelations, it appears probable that the 9.1-inch total for August 1838 at the Baltimore station, as given in U. S. Weather Bureau Bulletin W, may be in error by several inches; likewise, the rainfall data for both September and November.

CLASSIFIED LIST OF OBSERVATION STATIONS

PRECIPITATION STATIONS

The following table lists the precipitation stations whose records are included, arranged by States:

Precipitation stations

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Alabama					
Central Tower	Nonrecording, nonstandard rain gage.	1931–36	5	1	U. S. Forest Service, Montgomery, Ala.
Arizona					
San Carlos Reservoir.	Standard U. S. Weather Bureau rain gage and evaporation pan.	1930–36	7	1	Office of Indian Affairs, San Carlos irrigation project, Coolidge, Ariz.
United States Field Station, Sacaton.	Standard U. S. Weather Bureau rain gage.	1910–36	27	1	C. J. King, United States Field Station, Sacaton, Ariz.
Childs Fossil Creek power plant, Verde River.	do	1916–36	20	1	T. A. Hayden, Salt River Valley Water Users' Association, P. O. Box 1980, Phoenix, Ariz.
Verde River near Phoenix.	do	1930–36	6	1	Do.
Granite Reef diversion dam, near Phoenix.	do	1916–36 [1]	[1] 20	1	Do.
Salt River intake dam near Roosevelt.	do	1916–36	20	1	Do.
McNary	do	1920–36	16	1	Do.
Sawyer ranch, 25½ miles southwest of Tucson.	do	Apr. 25 to Dec. 31, 1936.		1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Rillito	do	May 1, 1927, to Dec. 31, 1931.	5	1	Do.
Tubac	do	Jan. 1, to Aug. 31, 1929, and 1930–31.	3	1	Do.
Phoenix	Nonrecording rain gage.	1934–36	3	1	Do.
Brownsville	Standard U. S. Weather Bureau rain gage.	1918–29	11	1	Do.
Santa Rita Experimental Range.	do	1901–37, 1922–37, 1931–37, 1935–37.	36, 15, 6, 2	22	Santa Rita Experimental Range, 304 Agriculture Bldg., University of Arizona, Tucson, Ariz.
Stafford	do	1913, 1932	2	2	U. S. Forest Service, Stafford, Ariz.
Coconino National Forest.	Nonrecording, nonstandard rain gage.	1918–36	18	1	Forest supervisor, Coconino National Forest, Flagstaff, Ariz.
Parker Creek Forest Influences Experimental Area.	Standard U. S. Weather Bureau rain gage.	1933–36	3	24	Parker Creek Forest Influences Experimental Area, Box 443, Globe, Ariz.
Prescott	Nonrecording, nonstandard rain gage.	1919–36 or 1934–36.	[2] 17 or 2	9	U. S. Forest Service Prescott, Arix.
Ranger station	Standard U. S. Weather Bureau rain gage.	1931–36 [3]	5	1	W. G. Mann, Kaibab National Forest, Williams, Ariz.
Arkansas					
Rice Branch Experiment Station.	Nonrecording rain gage	1929–36	8	1	G. H. Banks, University of Arkansas, Fayetteville, Ark.
Near Rice Branch Experiment Station.	do	1935–36	2	1	Do.
Do	do	1936	1	6	Do.

[1] Approximate. [2] One 17-year; eight 2-year. [3] May 15 to Sept. 15.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Arkansas—Contd.					
Forest Service guard stations.	Standard U. S. Weather Bureau rain gage.	1930–36	7	9	U. S. Forest Service, Hot Springs, Ark.
Do	Nonrecording, nonstandard rain gage.	1930–36	7	13	Do.
Do	Recording U. S. Weather Bureau rain gage.	1930–36	7	1	Do.
Russellville and Green Tower.	Nonrecording, nonstandard rain gage.	1931–36 or 1932–36	5 or 4	2	U. S. Forest Service, Russellville, Ark.
California					
Los Angeles County	Recording U. S. Weather Bureau rain gage and temperature.	1929–30	1	30	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	do	1930–31	1	37	Do.
Do	do	1931–32	1	37	Do.
Do	do	1932–33	1	37	Do.
Do	do	1933–34	1	38	Do.
Do	do	1934–35	1	39	Do.
Do	do	1935–36	1	39	Do.
San Bernardino County.	Standard U. S. Weather Bureau rain gage.	1925–36	11	1	Fred G. Hamilton, Southern California Edison Co., P. O. Box 135, Los Angeles, Calif.
Riverside County	do	1917–36	19	1	Do.
Los Angeles County	do	1905–36	31	1	Do.
Do	do	1926–36	10	1	Do.
Do	do	1930–36	6	3	Do.
Do	do	1880–90	10	2	C. H. Howell, Los Angles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	Nonrecording nonstandard rain gage.	1880–90	10	1	Do.
Do	Recording U. S. Weather Bureau rain gage and temperature.	1925–26	1	8	Do.
San Bernardino County.	Standard U. S. Weather Bureau rain gage.	1926–36	10	1	Fred G. Hamilton Southern California Edison Co., P. O. Box 135, Los Angeles, Calif.
Orange County	do	1930–36	7	10	M. N. Thompson, Orange County Flood Control District, Room 326, Courthouse Annex, Santa Ana, Calif.
Orange County and vicinity.	Nonrecording nonstandard rain gage.	1876–1936 [4]	61	92	Do.
Los Angeles County	Standard U. S. Weather Bureau rain gage.	1890–1900	10	14	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	do	1900–1910	10	16	Do.
Do	do	1910–20	10	41	Do.
Do	do	1920–30	10	224	Do.
Do	do	1930–36	6	272	Do.
Do	Nonrecording nonstandard rain gage.	1890–1900	10	12	Do.
Do	do	1900–1910	10	10	Do.
Do	do	1910–20	10	19	Do.
Do	do	1920–30	10	45	Do.
Do	do	1930–36	6	52	Do.
Do	Recording U. S. Weather Bureau rain gage and temperature.	1926–27	1	9	Do.
Do	do	1927–28	1	19	Do.
Do	do	1928–29	1	30	Do.

[4] Longest continuous record.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
California—Contd.					
Alhambra	Nonrecording rain gage	1930–36	7	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Modesto	do	1933–36	4	1	Do.
Ventura	do	1931–36	6	1	Do.
Hackamore	Standard U. S. Weather Bureau rain gage.	Oct. 22, 1931 to 1936.	5	1	Do.
Long Beach	do	do	6	1	Fred S. Porter, Long Beach Water Department, 308 Municipal Utilities Bldg., Long Beach, Calif.
Do	do		2	1	Do.
Along Owens River aqueduct system and in Los Angeles area.	do	1918–36	18	34	Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Los Angeles County	do		4	3	Lloyd Aldrich, City Engineer's Office, Room 608, City Hall, Los Angeles, Calif.
Copo	do	1928–36	9	1	California-Oregon Power Co., Medford, Oreg.
Calexico	do	1933–35	3	1	Bureau of Entomology and Plant Quarantine, Washington, D. C
Los Angeles County	Nonrecording non-standard rain gage.		4	3	Lloyd Aldrich, City Engineer's Office, Room 608, City Hall Los Angeles, Calif.
Do	Automatic recording rain gage.		[1] 2	8	Do.
Do	Manual recording rain gage.		[1] 2	3	Do.
San Bernardino County.	Standard U. S. Weather Bureau rain gage with maximum and minimum thermometer.	1933–36	4	2	F. E. Weymouth, Metropolitan Water District of Southern California, Los Angeles, Calif.
Lake County	Standard U. S. Weather Bureau rain gage.	1908–36	28	1	P. M. Downing, Pacific Gas & Electric Co., San Francisco, Calif.
Pasadena chlorine plant, Morris Dam.	do	1916–36	21	2	Morris S. Jones, City of Pasadena Water Department, Room 319, City Hall, Pasadena, Calif.
Pasadena	Recording U. S. Weather Bureau rain gage and temperature.	1913–36	24	1	Do.
Santa Clara and San Mateo Counties.	Standard U. S. Weather Bureau rain gage.	1930–36	7	20	A. L. Trowbridge, Stanford University, Calif.
Butte County	do	1908–36	28	6	P. M. Downing, Pacific Gas & Electric Co., San Francisco, Calif.
Yuba County	do	1908–36	28	2	Do.
Nevada County	do	1908–36	28	2	Do.
Amador County	do	1908–36	28	3	Do.
Placer County	do	1908–36	28	1	Do.
Tuolumne County	do	1908–36	28	4	Do.
Shasta County	do	1908–36	28	4	Do.
Alpine County	do	1908–36	28	2	Do.
Mendocino County	do	1908–36	28	1	Do.
Eldorado County	do	1908–36	28	1	Do.
Plumas County	do	1908–36	28	7	Do.
Los Angeles County	do	1925–36	11	1	Fred G. Hamilton, Southern California, Edison Co., P. O. Box 135, Los Angeles, Calif.
Do	do	1934–36	2	1	Do.
Do	do	1928–36	8	1	Do.
Do	do	1932–36	4	1	Do.

[1] Approximate.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
California—Contd.					
Kern County	Standard U. S. Weather Bureau rain gage.	1922-36	14	1	Fred G. Hamilton, Southern California, Edison Co., P. O. Box 135, Los Angeles, Calif.
Tulare County	do	1922-36	14	2	Do.
Do	do	1925-36	11	1	Do.
Kings County	do	1926-36	10	1	Do.
Tulare County	do	1923-36	13	1	Do.
Kern County	do	1930-36	6	1	Do.
Tulare County	do	1924-36	12	1	Do.
Do	do	1927-36	9	1	Do.
Do	do	1926-36	10	3	Do.
Do	do	1919-36	17	4	Do.
Kern County	do	1932-36	4	1	Do.
Ventura County	do	1923-36	13	1	Do.
Orange County	do	1922-36	14	1	Do.
Fresno County	do	1911-36	25	1	Do.
Do	do	1913-36	23	1	Do.
Do	do	1923-36	13	2	Do.
Do	do	1922-36	14	1	Do.
Do	do	1912-36	24	1	Do.
Kern County	do	1905-36	31	1	Do.
Do	do	1916-36	20	1	Do.
Do	do	1920-36	16	1	Do.
San Bernardino County.	do	1916-36	20	3	Do.
Do	do	1905-36	31	1	Do.
Los Angeles County	do	1904-36	32	1	Do.
Do	do	1905-36	31	1	Do.
Fresno County	do	1920-36	16	1	Do.
Modoc National Forest.	do	1925-32 [5]	7	1	Forest supervisor, Modoc National Forest, Alturas, Calif.
San Joaquin Experimental Range, Madera County.	Recording U. S. Weather Bureau rain gage and temperature.	1934-36	2	1	E. I. Kotok, California Forest and Range Experiment Station, Berkeley, Calif.
Institute of Forest Genetics.	Standard U. S. Weather Bureau rain gage.	1927-36	10	1	Do.
Santa Barbara	do	1935-37	2	9	U. S. Forest Service, Star Route, Santa Barbara, Calif.
Do	Nonrecording, nonstandard rain gage.	1935-37	2	18	Do.
Tejon district	Standard U. S. Weather Bureau rain gage.	1936	1	1	Houghton Durbrow, Santa Barbara National Forest, Santa Barbara, Calif.
California Forest and Range Experiment Station.	do	1931-36, 1932-36, or 1934-36.[6]	5, 4, or 2.	5	Forest supervisor, Stanislaus National Forest, Sonora, Calif.
Weaverville, Hayfork, and vicinity.	do	1920-36, 1930-36, or 1936.	16, 6, or 1.	5	Forest supervisor, Trinity National Forest, Weaverville, Calif.
Susanville Forest Nursery.	do	1930-36	6	1	Forest supervisor, U. S. Forest Service, Susanville, Calif.
Yreka, Happy Camp and Seiad, Klamath National Forest.	do	1917-36, 1930-36, or 1936.[7]	20, 6, or 1.	3	U. S. Forest Service, Yreka, Calif.
Stanislaus Branch Station.	do	1933-36 [8]	4	6	E. I. Kotok, California Forest and Range Experiment Station, Berkeley, Calif.
Colorado					
Colorado River Basin.	Standard U. S. Weather Bureau rain gage.	1936	1	26	Bureau of Reclamation, Custom House, Denver, Colo.

[5] Readings taken usually after rains.
[6] 1 station year long; 4 Apr. 1 to Nov. 5.
[7] 1 station seasonal, June 1 to Oct. 10.
[8] Summer months only.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Connecticut					
Torrington	Standard U. S. Weather Bureau rain gage	1922–36	15	1	S. H. Wadhams, Connecticut State Water Commission, 313 State Office Bldg., Hartford, Conn.
Do	do	1923–36	14	1	Do.
Voluntown	do	1934–36 [9]	3	1	Do.
Wallingford	do	1860–1936	77	1	Do.
Wilton	do	1909–36	28	1	Do.
Windsor	do	1934–36	3	1	Do.
Burlington	do	1936	1	3	W. H. Brothwell, Connecticut State Ground-Water Survey, 319 State Office Bldg., Hartford, Conn.
Cornwall	do	1934–36	3	1	S. H. Wadhams, Connecticut State Water Commission, 313 State Office Bldg., Hartford, Conn.
East Granby	do	1936	1	1	Do.
Glastonbury	do	1935–36	2	1	Do.
Norfolk	do	1916–36	21	1	Do.
Torrington	do	1936	1	1	W. H. Brothwell, Connecticut State Ground-Water Survey, 319 State Office Bldg., Hartford, Conn.
Naugatuck	Nonrecording nonstandard rain gage.	1897–1936	40	1	S. H. Wadhams, Connecticut State Water Commission, 313 State Office Bldg., Hartford, Conn.
Torrington	do	1920–36	17	1	Do.
Wilton	do	1933–36	4	1	Do.
New Britain	Recording nonstandard rain gage.	1928–36	9	1	Do.
Florida					
Vicinity of Lake Okeechobee.	Standard U. S. Weather Bureau rain gage.	1918–36	19	14	U. S. Engineer Office, U. S. Courthouse and Post Office Bldg., Jacksonville, Fla.
Marion and Putnam Counties.	do	1936	1	8	Do.
Do	do	1936	1	1	Do.
Lake Okeechobee	Recording U. S. Weather Bureau rain gage and temperature.	1935–36	2	1	Do.
Orlando	Standard U. S. Weather Bureau rain gage.	1927–31, 1933 to May 21, 1936.	8	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
County farm 4 miles southeast of Orlando.	do	1928, June 3 to Dec. 31, 1929, and 1930–36.	9	1	Do.
County home 4½ miles southeast of Orlando.	do	July 3, 1933, to June 3, 1935, and May 21, 1936, to date.	2	1	Do.
1 mile northwest of Orlando.	do	July 16 to Dec. 31, 1929, 1930, and 1933–36.	6	1	Do.
5 miles northwest of Davenport.	do	July 15 to Dec. 31, 1935, and 1936.	1	1	Do.
12 miles southwest of Orlando.	do	Apr. 25, 1935, to Dec. 31, 1936.	1	1	Do.
15 miles southwest of Orlando.	do	July 1, 1935, to Dec. 31, 1936.	1	1	Do

[9] Records incomplete.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Georgia					
T. V. A. and Clayton.	Standard U. S. Weather Bureau rain grge.	1934–36	2	5	U. S. Forest Service, Gainesville, Ga.
Blue Ridge Range	Nonstandard, nonrecording rain gage.	1934–36	2	1	Do.
Idaho					
Fort Hall	Standard U. S. Weather Bureau rain gage and maximum and minimum thermometer.	June 1932 to 1936	5	1	U. S. Office of Indian Affairs, Fort Hall, Idaho.
Blackfoot Dam, 17 miles northwest of Henry.	do	1924–36	13	1	Do.
Sugar City	Standard U. S. Weather Bureau rain gage.	Apr. 17, 1933, to Oct. 7, 1934.	2	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Deception Creek Experimental Forest, Kootenai County.	Nonrecording, nonstandard rain gage.	1912–36	25	1	Stephen N. Wyckoff, National Rocky Mountain Forest and Range Experiment Station, Federal Bldg., Missoula, Mont.
Idaho City	Standard U. S. Weather Bureau rain gage.	1932–36	5	1	U. S. Weather Bureau: Missoula, Mont.
Do	do	1932–36 [10]	5	1	Do.
Boise National Forest.	do	1900–37, 1909–37, 1911–37, 1916–37.[11]	37, 28, 26, 21	[11] 16	G. B. Mains, supervisor: Boise National Forest, Boise, Idaho.
Do	Nonstandard, nonrecording rain gage.	1932–37	5	50	Do.
Idaho National Forest.	Standard U. S. Weather Bureau rain gage.	1934, 1930 [12]	2	[12] 5	Idaho National Forest, McCall, Idaho.
Do	Nonrecording, nonstandard rain gage.	July 1 to Sept. 15, 1936.	1	10	Do.
Challis National Forest.	Standard U. S. Weather Bureau rain gage.	1931–36 [13]	6	5	E. E. McKee, supervisor, Challis National Forest, Challis, Idaho.
Intermountain Forest and Range Experiment Station.	do	1924–36	3	1	G. D. Pickford, United States Sheep Station Branch, Dubois, Idaho.
Targhee National Forest.	Nonrecording, nonstandard rain gage.	April to September 1936.	1	1	S. C. Scribner, supervisor, Targhee National Forest, St. Anthony, Idaho.
Lemhi (Challis) National Forest.	Standard U. S. Weather Bureau rain gage.	1915–36	22	1	E. E. McKee, supervisor, Lemhi (Challis-National Forest, Mackay, Idaho.
Elk Creek, Garden Valley, Whites Creek, and vicinity.	do	1909–37, 1917–37, 1924–37, 1929–37.	28, 20, 13, 8	[14] 9	W. B. Rice, forest supervisor, Payette National Forest, 210 Main St., Boise, Idaho.
Payette National Forest.	Nonrecording, nonstandard rain gage.	1929–37	8	3	Do.
Illinois					
4 miles from Quincy	Standard U. S. Weather Bureau rain gage.	1935–36	2	1	U. S. Engineer Office, Rock Island, Ill.
Bloomington Reservoir, McLean County.	do	1930–36	7	3	Illinois State Water Survey Division, Urbana, Ill.
Carbondale Reservoir, Jackson County.	do	1929–36	8	8	Do.
Centralia Reservoir, Marion County.	do	1926–36	11	3	Do.

[10] June 20 to Sept. 30.
[11] 11 stations are intermittent.
[12] 4 stations are seasonal, July 1 to Sept. 15.
[13] 3 months in summer.
[14] 5 stations for season July to September.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Illinois—Contd.					
Lake Bracken Reservoir, Knox County.	Standard U. S Weather Bureau rain gage.	1929-36	8	3	Illinois State Water Survey Division, Urbana, Ill.
Staunton Reservoir, Macoupin County.	do	1929-36	8	3	Do.
West Frankfort Reservoir and vicinity Franklin County	do	1928-36	9	4	Do.
4 miles from Savanna	do	1935-36	2	1	U. S. Engineer Office, Rock Island, Ill.
2 miles from Albany	do	1935-36	2	1	Do.
1 mile from New Boston.	do	1930-36 [1]	[1] 7	1	Do.
3 miles from Keithsburg.	do	1930-36 [1]	[1] 7	1	Do.
4 miles from Oquawka	do	1930-36 [1]	[1] 7	1	Do.
4 miles from Mallard	do	1930-36 [1]	[1] 7	1	Do.
3 miles from Mayer	do	1930-36 [1]	[1] 7	1	Do.
3 miles from Quincy	do	1930-36 [1]	[1] 7	1	Do.
5 miles from Quincy	do	1935-36	2	1	Do.
4 miles from Quincy	do	1935-36	2	1	Do.
Rock Island district	do	1935-36	2	10	Do.
Chicago	do	1926-36	11	4	Loran D. Gayfon, City of Chicago Bureau of Engineering, City Hall, Chicago, Ill.
Lockport and Brandon road, on Des Plaines River, Will County.	do	1933-36	4	2	U. S. Engineer Office, 932 U. S. Post Office Bldg., Chicago, Ill.
Dresden Island lock on Illinois River, Grundy County.	do	1933-36	4	1	Do.
Marseilles lock and Starved Rock lock on Illinois River, La Salle County.	do	1933-36	4	2	Do.
5 miles from Oquawka.	Standard U. S. Weather Bureau rain gage, maximum and minimum temperature.	1935-36	2	1	U. S. Engineer Office, Rock Island, Ill.
4 miles from New Boston.	do	1935-36	2	1	Do.
2 miles from Quincy	do	1935-36	2	1	Do.
4 miles from Savanna.	Standard U. S. Weather Bureau rain gage.	1935-36	2	1	Do.
2 miles from Albany	do	1935-36	2	1	Do.
5 miles from Quincy	do	1935-36	2	1	Do.
Centralia	do	March 1918 to June 1926.[2]	9	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Nashville	do	April 1917 to June 1918.	2	1	Do.
Near Hardin	do	1932-34	3	1	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Near Kampsville	do	1933-34	2	1	Do.
Near Pearl	do	1932-33	2	1	Do.
Near Florence	do	1932-33	2	1	Do.
Near Meredosia	do	1932-33	2	1	Do.
Indiana					
Bicknell	do	1934-36	3	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Orleans	do	1934-36	3	1	Do.
Do	do	1935-36	2	1	Do.
Mitchell and Valonia.	do	1936	1	2	U. S. Forest Service, 7th St., Bedford, Ind.
Lafayette	do	August 1919 to Oct. 9, 1927.	8	1	Bureau of Entomology and Plant Quarantine. Washington, D. C.

[1] Approximate.

[2] Records incomplete.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Iowa					
Bellevue	Standard U. S. Weather Bureau rain gage, maximum and minimum temperature.	1935–36	2	1	U. S. Engineer Office, Rock Island, Ill.
3 miles from Clinton	do	1935–36	2	1	Do.
4 miles from LeClaire	do	1935–36	2	1	Do.
Davenport	do	1935–36	2	1	Do.
2 miles from Muscatine.	do	1935–36	2	1	Do.
Keokuk		1935–36	2	1	Do.
2 miles from Muscatine.	Standard U. S. Weather Bureau rain gage.	1935–36	2	1	Do.
4 miles from Grandview.	do	1930–36 [1]	[1] 7	1	Do.
3 miles from Toolsboro.	do	1935–36	2	1	Do.
4 miles from Burlington.	do	1935–36	2	1	Do.
2 miles from Burlington.	do	1930–36 [1]	[1] 7	1	Do.
Ralson Creek drainage basin.	do	1923–36	14	6	Iowa Institute of Hydraulic Research, Iowa City, Iowa.
Lake Wapello	do	1934–36	3	2	O. J. Baldwin, 205 Engineers Hall, Iowa City, Iowa.
Ralson Creek drainage basin.	Recording U. S. Weather Bureau rain gage and temperature.	1923–36	14	1	Iowa Institute of Hydraulic Research, Iowa City, Iowa.
West end of Fort Madison.	Standard U. S. Weather Bureau rain gage.	1921–36 [3]	16	1	P. L. Mercer, Mississippi River Power Co., Keokuk, Iowa.
2 miles from Muscatine.	do	1935–36	2	1	U. S. Engineer Office, Rock Island, Ill.
3 miles from Toolsboro.	do	1935–36	2	1	Do.
4 miles from Burlington.	do	1935–36	2	1	Do.
Guttenberg	Standard U. S. Weather Bureau rain gage, maximum and minimum temperature.	1935–36	2	1	Do.
3 miles from Dubuque.	do	1935–36	2	1	Do.
Clarinda	Recording Fergusson rain gage.	1932–36 [1]	[1] 5	2	G. W. Musgrave, Soil Conservation Service, Washington, D. C.
Kansas					
Wichita	Standard U. S. Weather Bureau rain gage.	1918–36 [15]	38	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Manhattan	do	1913–36	23	1	A. L. Clapp, Kansas State College, Manhattan, Kans.
Hays	do	1930–36	6	1	L. E. Call, Manhattan, Kans.
Tribune	do	1913–36	23	1	Do.
Garden City	do	1908–36	28	1	Do.
Rest	do	1925–31	6	1	A. L. Clapp, Kansas State College, Manhattan, Kans.
Columbus	do	1927–36	9	1	Do.
Moran	do	1927–35	8	1	Do.
Fort Scott	do	1927–30	3	1	Do.
Parsons	do	1927–33	6	1	Do.
McLouth	do	1932–36	4	1	Do.
Newman	do	1932–36	4	1	Do.
Blair	do	1932–36	4	1	Do.
Atchison	do	1932–36	4	1	Do.
Basil	do	1932–36	4	1	Do.
Goddard	do	1932–36	4	1	Do.
Pratt	do	1932–33	1	1	Do.
Hays	Recording rain gage	1930–36	6	1	L. E. Call, Manhattan, Kans.

[1] Approximate. [3] Records not complete. [15] No record for winter months.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Louisiana					
Baton Rouge	Standard U. S. Weather Bureau rain gage.	1933–36	4	7	Glen N. Cox, Louisiana State University, Baton Rouge, La.
Do	Recording Fergusson weighing rain gage.	1933–36	4	1	Do.
Do	Nonrecording rain gage.	1927–36	10	1	Bureau of Entomology and Plant Industry, Washington, D. C.
Mound	Standard U. S. Weather Bureau rain gage.	1913 to February 1931.	19	1	Do.
Bogalusa Branch	do	1932–34	2	1	Southern Forest Experiment Station, Bogalusa, La.
Massachusetts					
Milton	do	1931–36	6	1	Charles F. Brooks, Blue Hill Observatory, Milton, Mass.
Do	Nonrecording nonstandard rain gage.	1885–1936	52	1	Do.
Do	Recording U. S. Weather Bureau rain gage and temperature.	1885–1936	52	1	Do.
Williamstown	Standard U. S. Weather Bureau rain gage.	1936		1	M. Westveld, 335 Prospect St., New Haven, Conn.
Michigan					
Upper Michigan National Forest.	do	1926–36 or 1934–36.	10 or 3	4	U. S. Forest Service, Escanaba, Mich.
Upper Michigan National Forest, Steuben Tower.	do	1935–37 [16]	2	1	Do.
Silver Creek, Mack Lake, and East Tawas.	do	1917–37 or 1932–37.	20 or 5	3	U. S. Forest Service, East Tawas, Mich.
Watersmeet Nursery.	Nonrecording, nonstandard rain gage.	1936	1	1	U. S. Forest Service, Ironwood, Mich.
Minnesota					
Cass Lake	Recording U. S. Weather Bureau rain gage and temperature.	1918–36	18	1	U. S. Forest Service, Cass Lake, Minn.
Chippewa National Forest.	Nonrecording, nonstandard rain gage.	1936	1	45	Do.
Mississippi					
Vicinity of Meridian	Recording rain gage	1935–36	2	2	Soil Conservation Service, Meridian, Miss.
Jackson	Standard U. S. Weather Bureau rain gage.	1936 [17]	1	1	U. S. Forest Service, Jackson, Miss.
Harrison Experimental Forest.	do	1934–36	2	1	Harrison Experimental Forest, Saucier, Miss.
Holly Springs Branch.	Recording, nonstandard rain gage.	1931–37	6	1	Southern Forest Experiment Station, Box 71, Holly Springs, Miss.
Missouri					
4 miles from La Grange.	Standard U. S. Weather Bureau rain gage.	1935–36	2	1	U. S. Engineer Office, Rock Island, Ill.
4 miles from Hannibal.	do	1935–36	2	1	Do.
3 miles from Louisiana.	do	1935–36	2	1	Do.
Canton	Standard U. S. Weather Bureau rain gage, maximum and minimum temperature.	1935–36	2	1	Do.
2 miles from Saverton.	do	1935–36	2	1	Do.

[16] Apr. 1 to Nov. 1.

[17] 2 weeks' record.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Missouri—Contd.					
4 miles from La Grange.	Standard U. S. Weather Bureau rain gage.	1935–36	2	1	U. S. Engineer Office, Rock Island, Ill.
4 miles from Hannibal.	do	1935–36	2	1	Do.
3 miles from Louisiana.	do	1935–36	2	1	Do.
Bethany	Recording Fergusson rain gage.	1932–36 [1]	[1] 5	2	G. W. Musgrave, Soil Conservation Service, Washington, D. C.
St. Louis University, St. Louis.	Standard U. S. Weather Bureau rain gage.		26	1	James Macelwane, St. Louis University, St. Louis, Mo.
Do	Nonrecording nonstandard rain gage.		26	1	Do
Do	Recording U. S. Weather Bureau rain gage and temperature.		26	1	Do.
St. Louis	Standard U. S. Weather Bureau rain gage.		[1] 20	3	John B. Dean, St. Louis Water Division, 312 City Hall, St. Louis, Mo.
Licking and Willow Springs.	do	1936	1	2	Gardner Purchase Unit, U. S. Forest Service, 218½ West Walnut St., Springfield, Mo.
Montana					
St. Ignatius	do	1904–36	33	1	Henry Gerharz, U. S. Indian Service, St. Ignatius, Mont.
Lonepine	do	1920–36	17	1	Do.
Polson	do	1910–36	27	1	Do.
Sun River district	do	1913–36 [18]	23	2	B. P. Martin, U. S. Forest Service, Augusta, Mont.
Do	Nonrecording, nonstandard rain gage.	1913–36 [18]	23	3	Do.
Libby	Standard U. S. Weather Bureau rain gage.	1917–36	20	1	Forest supervisor, Kootenai National Forest, Libby, Mont.
Kootenai National Forest.	Nonrecording, nonstandard rain gage.	May 1 to Oct. 1, 1936.	1	9	Do.
Deerlodge National Forest.	do	1936 [19]	1	19	Forest supervisor, Department of Agriculture, Butte, Mont.
Do	Nonrecording rain gage.	June 1 to Sept. 30, 1936.	1	2	Do.
Absaroka National Forest.	Nonrecording, nonstandard rain gage.	July 20 to Sept. 30, 1936.	1	1	G. E. Martin, Absaroka National Forest, Livingston, Mont.
McClellan Station	do	June 25 to Sept. 30, 1936.	1	1	Forest supervisor, Helena National Forest, Helena, Mont.
Lincoln Range	do	1934–36 [20]	3	1	Do.
Sun River district	do	1913–37 [21]	24	2	U. S. Forest Service, Augusta, Mont.
Do	Standard U. S. Weather Bureau rain gage.	1913–37	24	2	Do.
Chouteau	do	1890–1937	47	9	U. S. Forest Service, Chouteau, Mont.
Lolo National Forest.	Nonrecording, nonstandard rain gage.	1930–37 [22]	7	47	E. H. Murick, Lolo National Forest, Missoula, Mont.
Daisy Peak	Standard U. S. Weather Bureau rain gage.	Aug. 11 to Sept. 10, 1936.	1	1	David Lake, forest ranger, Harlowton, Mont.
Great Falls	Standard rain gage	1896–1937	48	1	L. H. McLean, district ranger, Great Falls, Mont.
Belt Creek	Standard U. S. Weather Bureau rain gage.	May 6 to Sept. 30, 1936.	1	1	U. S. Forest Service Neihart, Mont.
King's Hill	do	Aug. 10 to Sept. 30, 1936.	1	1	Do.
Monument Peak	do	do	1	1	Do.

[1] Approximate
[18] Record fairly complete.
[19] Intermittent readings May 1 to Oct. 31.
[20] June 1 to Oct. 15.
[21] July 1 to Sept. 15.
[22] June 15 to Aug. 31.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Montana—Contd.					
National Rocky Monntain Forest and Range Experiment Station.	Standard U. S. Weatner Bureau rain gage.	1934-36	3	2	Stephen N. Wyckoff, National Rocky Mountain Forest and Range Experiment Station, Federal Building, Missoula, Mont.
Vigilante Experimental Range, Madison County.	Nonrecording, nonstandard rain gage.	1912-36	25	1	Do.
United States Range Livestock Experiment Station.	do	1912-36	25	1	Do.
Missoula	Recording U. S. Weather Bureau rain gage.	1936	1	1	Do.
Haugan	Standard U. S. Weather Bureau rain gage.	1911-37	26	1	A. H. Abbott, Cabinet National Forest, Thompson Falls, Mont.
Trout Creek	do	1911-37	26	1	Do.
Thompson Falls	do	1911-37	26	1	Do.
Cabinet National Forest.	Nonrecording, nonstandard rain gage.	1933-37	4	35	Do.
Bitterroot National Forest.	do	1933-36 [23]	4	10	Forest supervisor, Bitterroot National Forest, Hamilton, Mont.
Snake Creek in Sawtooth Range near Butte.	Standard U. S. Weather Bureau rain gage.	1933-36 [10]	4	1	U. S. Weather Bureau, Missoula, Mont.
Iron Mountain in Sawtooth Range near Butte.	do	1932-36 [10]	5	1	Do.
Garden Valley in Payette Forest near Butte.	do	1933-36 [10]	4	1	Do.
Shafer Butte	do	1933-36 [10]	4	1	Do.
Bald Mountain	do	1933-36 [10]	4	1	Do.
Nevada					
Rye Patch Dam	do	1936	1	1	L. J. Foster, Bureau of Reclamation, Humboldt project, Lovelock, Nev.
Fallon	do	Mar. 6, 1933, to Mar. 11, 1935.	2	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
New Hampshire					
Pierce Bridge	do	1931-36	5	1	M. Westveld, 335 Prospect St., New Haven, Conn.
Fabyans	do	1932-36	4	2	Do.
Bartlett	do	1932-36	4	4	Do.
White Mountain National Forest.	do	1929-36	7	1	C. L. Graham, U. S. Forest Service, Laconia, N. H.
New Jersey					
Raymond Dam, Wanaque.	do	1920-36	17	1	Crystal Brown, North Jersey District Water Supply Commission, Wanaque, N. J.
Do	do	1921-36	16	1	Do.
Do	do	1932-36	5	1	Do.
Passaic County	Recording U. S. Weather Bureau rain gage and temperature.	1906-36	31	1	A. T. Cook, Passaic Valley Water Commission, City Hall Annex, Paterson, N. J.
Newark	Standard U. S. Weather Bureau rain gage.	1892-1936	45	1	William Wiener, Central High School, Newark, N. J.
Near New Lisbon	do	1934-36	3	1	U. S. Forest Experiment Station, 3437 Woodland Ave., Philadelphia, Pa.

[10] June 20 to Sept. 30.

[23] June 1 to Sept. 1.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
New Mexico					
Eddy County	Standard U. S. Weather Buaeau rain gage.	1902-36	35	2	L. E. Foster, U. S. Bureau of Reclamation, Carlsbad, N. Mex.
Jornada Experiment Range.	do	1914-36, 1934-36	22, 2	18	Jornada Experiment Range, Box 671, Las Cruces, N. Mex.
New York					
Voorheesville	do	1915-36	22	1	Robert E. Horton, Voorheesville, N. Y.
Do	Recording U. S. Weather Bureau rain gage and temperature.	1917-36	20	1	Do.
Babylon	Nonrecording rain gage.	1929-36	8	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Smyrna	Standard U. S. Weather Bureau rain gage.	1936		1	M. Westveld, 335 Prospect St., New Haven, Conn.
North Carolina					
Near Tapoco	do	1919-36	18	1	J. W. Rickey, Aluminum Co. of America, Pittsburgh, Pa.
Near Robbinsville	do	1927-36	9	1	Do.
Near Spencer	do	1927-36	9	1	Do.
Near Badin	do	1916-36	21	1	Do.
Coweeta, Copper Basin.	do	1934-36	3	75	U. S. Forest Service, Asheville, N. C.
Chadbourn	Nonrecording rain gage.	1922-36	15	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Oxford	do	1935-36	2	1	Do.
Statesville	Recording Fergusson rain gage.	1932-36 [1]	[1]5	2	G. W. Musgrave, Soil Conservation Service Washington, D. C.
North Dakota					
Souris Basin	Standard U. S. Weather Bureau rain gage.	1931-36	5	1	Lake State Forest Experiment Station, Forest Service, Denbigh, N. Dak.
Ohio					
Ohio River, lock and dam No. 31.	Nonrecording, nonstandard rain gage.	Nov. 1, 1931, to 1936.	5	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Muskingum drainage basin.	Standard U. S. Weather Bureau rain gage.	May 1936 to date.	[1]5	15	Waldo E. Smith, Muskingum Watershed Conservancy District, New Philadelphia, Ohio.
Miami Conservancy District.	do		8-20	10	Miami Conservancy District, Dayton, Ohio.
Do	Recording rain gage		3	1	Do.
11 miles southwest of Toledo.	Standard U. S. Weather Bureau rain gage, maximum and minimum temperature.	1929-30, May 1 to Aug. 31, 1931; May 1 to Dec. 31, 1932; Jan. 1, 1933, to Nov. 31, 1934.	5	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Minerva, Hopedale, and Cambridge.	Nonrecording nonstandard rain gage.	1934-36	3	1	Do.
Ohio River, lock and dam No. 20.	Standard U. S. Weather Bureau rain gage.	June 20, 1917, to 1936.[24]	20	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Ohio River, lock and dam No. 21.	do	June 1924 to 1936.	14	1	Do.
Ohio River, lock and dam No. 22.	do	Oct. 19, 1924, to 1936.	12	1	Do.
Ohio River, lock and dam No. 23.	do	June 1, 1932, to 1936.	5	1	Do.
Ohio River, lock and dam No. 24.	do	June 1, 1931, to 1936.	6	1	Do.

[1] Approximate.
[24] No record for December 1928 and June to October 1931.

Precipitation stations—Continued

Location	Type of station	Years of record: Period covered	Years of record: Length in years	Number of stations	Official or agency
Ohio—Continued					
Ohio River lock and dam No. 41.	Standard U. S. Weather Bureau rain gage.	May 11, 1921, to 1936.	16	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Ohio River, Emsworth, Dashield, and Montgomery locks and dams.	do	October 1934 to 1936.	2	3	Do.
Ohio River locks and dams Nos. 4, 5, 7–11.	do	October 1934 to 1936.	2	7	Do.
Ohio River lock and dam No. 14.	do	September 1926 to 1936.[25]	11	1	Do.
Ohio River lock and dam No. 15.	do	Nov. 1, 1927, to 1936.	9	1	Do.
Ohio River lock and dam No. 16.	do	Sept. 15, 1919, to 1936.[26]	17	1	Do.
Ohio River lock and dam No. 17.	do	Nov. 11, 1929, to 1936.	7	1	Do.
Ohio River lock and dam No. 18.	do	October 1924 to 1936.	12	1	Do.
Oklahoma					
Kingfisher, Blaine, and Logan Counties.	Nonrecording, nonstandard rain gage.	1936	1	153	Soil Conservation Service, Washington, D. C.
Perkins, Heavener, Lone Grove, and Guthrie.	Standard U. S. Weather Bureau rain gage.	1931–36 [1]	6	4	Dean of Agriculture, Oklahoma Agricultural and Mechanical College, Stillwater, Okla.
Stillwater	do	1893–1936 [27]	44	1	Do.
Guthrie	Recording Fergusson rain gage.	1932–36 [1]	5	2	G. W. Musgrave, Soil Conservation Service, Washington, D. C.
Eufaula	Standard U. S. Weather Bureau rain gage, maximum and minimum temperature.	March 1933 to 1936.	4	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Oregon					
Medford	Standard U. S. Weather Bureau rain gage.		[1] 4	1	R. A. Worls, Medford Experiment Station, Medford, Oreg.
Moro	do		[1] 26	1	D. E. Stephens, Branch Experiment Station, Moro, Oreg.
Pendleton	do		[1] 7	1	G. A. Mitchell, Pendleton Field Station, Pendleton, Oreg.
Hermiston	do		[1] 6	1	U. S. Umatilla Field Station, Hermiston, Oreg.
Keno	do	1928–36	9	2	California-Oregon Power Co., Medford, Oreg.
Rocky Point (Upper Klamath Lake).	do	1935–36	2	1	Do.
Bonneville	do	1934–36	3	1	War Department, Office of District Engineer, Portland, Oreg.
Medford	do	Apr. 11, 1932, to May 4, 1936.	4	5	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Wallowa	Recording U. S. Weather Bureau rain gage and temperature.	1904–37	33	1	Rolland Huff, Wallowa National Forest, Enterprise, Oreg.
Enterprise	do	1930–37	7	1	Do.

[1] Approximate.
[25] No record for October 1935.
[26] No record for December 1930 and 1935.
[27] No record for 1916.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Oregon—Continued					
Redwood Range Station.[28]	Standard U. S. Weather Bureau rain gage.	1934–36	3	1	U. S. Forest Service, Siskiyou National Forest, Grants Pass, Oreg.
Siskiyou National Forest.	Nonrecording, nonstandard rain gage.	1934–36 [29]	3	10	Do.
Siuslaw National Forest.	do	1930–36 [30]	7	30	R. S. Shelly, Siuslaw National Forest, Eugene, Oreg.
Whitman National Forest.	do	1914–37 [31]	13	38	R. E. Foote, Whitman National Forest, Baker, Oreg.
Ochoco National Forest.	do	1936 [32]	1	24	Ochoco National Forest, Prineville, Oreg.
Deschutes National Forest.	do	1931–36 [33]	5	20	Carl B. Neal, Deschutes National Forest, Bend, Oreg.
Pendleton	Standard U. S. Weather Bureau rain gage.	1932–36	4	6	J. F. Irwin, Forest Service, Pendleton, Oreg.
Do	Nonrecording, nonstandard rain gage.	1926–36	10	17	Do.
Wallowa National Forest.	do	1934–37	3	15	Rolland Huff, Wallowa National Forest, Enterprise, Oreg.
Joseph	Recording U. S. Weather Bureau rain gage and temperature.	1891–1937	46	1	Do.
Pennsylvania					
Lehigh University, Bethlehem.	do	1926–36 [1]	[1] 11	1	H. G. Payrow, Lehigh University, Bethlehem, Pa.
Fayette County	Standard U. S. Weather Bureau rain gage.	1933–36	3	1	James E. Steuart, West Penn Power Co., 14 Wood St., Pittsburgh, Pa.
Allegheny River locks and dams Nos. 1–4, 6–8.	do	October 1934 to 1936.	2	7	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Monongahela River locks and dams Nos. 1–3, 5, 6, 8, 11–14.	do	do	2	10	Do.
Carlisle	do	1918–25	7	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
South Carolina					
Pee Dee Experiment Station, 2 miles north of Florence.	do	1914–36	23	1	Do.
Charleston	Nonrecording rain gage	July 1936 to date	1	1	Do.
Columbia	Nonrecording, nonstandard rain gage.	1935–36 [34]	1	5	U. S. Forest Service, Columbia, S. C.
South Dakota					
Custer	Standard U. S. Weather Bureau rain gage.	1912–36	24	1	U. S. Forest Service, Custer, S. Dak.
Vale	do	1908–36	29	1	Bureau of Reclamation Newell, S. Dak.
Orman	do	do	29	1	Do.
Tennessee					
Winchester	do	Sept. 12, 1929, to June 15, 1931.	2	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Fayetteville	do	June 16, 1931, to Mar. 26, 1934.	3	1	Do.

[1] Approximate.
[28] Records prior to 1934 kept at Page Creek Station.
[29] 3-month periods.
[30] June to September.
[31] Summer months only.
[32] During fire season.
[33] June 1 to Sept. 30.
[34] July 1 to Sept. 30.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Texas					
College Station	Standard U. S. Weather Bureau rain gage.		6–48	19	A. B. Conner, Texas Agricultural Experiment Station, College Station, Tex.
Temple	do	1931–36	6	5	Do.
Tyler	do	1931–36	6	5	Do.
Spur	do	1931–36	6	3	Do.
College Station	Recording U. S. Weather Bureau rain gage.		6–10	7	Do.
Vicinity of Temple	Standard U. S. Weather Bureau rain gage.	1934–36	3	30	K. W. Woodman, Soil Conservation Service, Temple, Tex.
Port Lanoca	do	January 1933 to September 1936.	4	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Vicinity of Temple	Recording rain gage	1934–36	3	7	K. W. Woodman, Soil Conservation Service, Temple, Tex.
Menard	Standard U. S. Weather Bureau rain gage.	Apr. 1, 1929, to 1936.	8	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Uvalde	do	1914–36	23	1	Do.
Dallas	do	1905–36	32	1	Do.
Temple	Recording Fergusson rain gage.	1932–36 [1]	[1] 5	2	G. W. Musgrave, Soil Conservation Service, Washington, D. C.
Tyler	do	1932–36 [1]	[1] 5	2	Do.
Utah					
Weber County	Standard U. S. Weather Bureau rain gage.	1895–1936 [35]	42	1	Bureau of Reclamation, Ogden, Utah.
Midvale	do	June 10, 1929, to 1936.	8	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Desert Range Branch Station.	do	1931–36 or 1933–36.	5 or 3	2	Selars S. Hutchings, Intermountain Forest and Range Experiment Station, Milford, Utah.
Great Basin Branch Station.	do	1936	1	5	Raymond Price, Intermountain Forest and Range Experiment Station, Ephraim, Utah.
Wasatch Branch Station, David County.	Nonrecording, nonstandard rain gage.	1936 [29]	1	62	A. R. Croft, Intermountain Forest and Range Experiment Station, Bountiful, Utah.
Do	Recording U. S. Weather Bureau rain gage and temperature.	1936 [29]	1	2	Do.
Virginia					
Norfolk	Nonrecording rain gage.	1929–36	8	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Washington					
Newman Lake	Standard U. S. Weather Bureau rain gage.	1931–36	6	1	Do.
Pullman	Recording Fergusson rain gage.	1932–36 [1]	[1] 5	2	G. W. Musgrave, Soil Conservation Service, Washington, D. C.
Sullivan Lake, Kamksu National Forest.	Standard U. S. Weather Bureau rain gage.	1931–33 [31]	2	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Newman Lake	do	1931–36 [36]	5	1	Do.

[1] Approximate.
[29] 3-month periods.
[31] Summer months only.
[35] Records intermittent.
[36] June to October.

Precipitation stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Washington—Contd.					
Republic	Standard U. S. Weather Bureau rain gage.	1926–36 [37]	10	2	A. D. Moir, Forest Service, Republic, Wash.
Do	Nonstandard, nonrecording rain gage.	1926–36 [21]	10	32	Do.
Chelan National Forest.	Standard U. S. Weather Bureau rain gage.	1925–36 [38]	12	5	P. T. Harris, Chelan National Forest, Okanogan, Wash.
Do	Nonrecording, nonstandard rain gage.	1935–36 [21]	2	22	Do.
Snoqualmie National Forest.	do	1934–36 [21]	3	9	John C. Kuhns, U. S. Forest Service, 524 Federal Bldg., Seattle, Wash.
Columbia National Forest.	do	1934–36 [39]	2	39	K. P. Cecil, Box 60, Vancouver, Wash.
West Virginia					
Tygart River, Tygart Dam.	Standard U. S. Weather Bureau rain gage.	October 1934 to 1936.	2	1	U. S. Engineer Office, 1420 Enquirer Building, Cincinnati, Ohio.
Little Kanawha River lock and dam No. 3.	do	1931–36	5	1	Do.
Kanawha River Marmet locks and dam.	do	Oct. 26, 1935, to 1936.	1	1	Do.
Kanawha River	Recording U. S. Weather Bureau rain gage and temperature.	1936	1	1	Do.
Parsons	Standard U. S. Weather Bureau rain gage.	1931–36	5	1	A. A. Wood, U. S. Forest Service, Elkins, W. Va.
Tucker County	do	1930–36	6	1	James E. Stewart, West Pennsylvania Power Co., 14 Wood St., Pittsburgh, Pa.
Wisconsin					
La Crosse and Monroe Counties.	do	1935–36 [1]	[1] 2	16	M. W. Torkelson, Wisconsin State Planning Board, State Office Bldg., Madison, Wis.
Do	Recording U. S. Weather Bureau rain gage.	1935–36 [1]	[1] 2	5	Do.
La Crosse	Recording Fergusson rain gage.	1932–36 [1]	[1] 5	1	G. W. Musgrave, Soil Conservation Service, Washington, D. C.
Chequamegon National Forest.	Standard U. S. Weather Bureau rain gage.	1933–36 [31]	3	1	U. S. Forest Service, Washburn, Wis.
Upper Mississippi Erosion Experiment Station.	Nonstandard, nonrecording rain gage.	1933–36	4	3	Lake States Forest Experiment Station, Box 643, La Crosse, Wis.
Nicolet National Forest.	Standard U. S. Weather Bureau rain gage.	1933–36 or 1936	3 or 1	4	U. S. Forest Service, Rhinelander, Wis.
Do	Nonstandard, nonrecording rain gage.	1936	1	1	Do.
Wyoming					
Guernsey Dam, 2 miles west of Guernsey.	Standard U. S. Weather Bureau rain gage and temperature.	1931–36	6	1	Bureau of Reclamation, Guernsey, Wyo.

[1] Approximate.
[21] July 1 to Sept. 15.
[31] Summer months only.
[38] June to October.
[37] May 1 to Sept. 30.
[38] June 1 to Sept. 15.
[39] 75-day period.

CENTRAL METEOROLOGIC STATIONS

The following stations consist of a recording rain gage with maximum and minimum thermometers:

Central meteorologic stations

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Arizona				
Santa Rita Experiment range.	1931–37	6	1	Santa Rita Experiment Range, 304 Agriculture Bldg., University of Arizona, Tucson, Ariz.
Globe	1934–36	2	1	Parker Creek Forest Influences Experiment Area, Box 443, Globe, Ariz.
California				
Los Angeles County	1926–36	10	4	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Santa Barbara	1935–37	2	3	U. S. Forest Service, Star Route, Santa Barbara, Calif.
Chuchupate Range	May to November 1936.	1	1	Houghton Durbrow, Teton District, Santa Barbara National Forest, Santa Barbara, Calif.
San Joaquin Experimental Range, Madera County.	1934–36	2	1	E. I. Kotok, California Forest and Range Experiment Station, Berkeley, Calif.
Burgess Springs Experimental Range, Lassen County.	June to October 1936.	1	1	Do.
Blacks Mountain Experiment Forest, Lassen County.	do	1	1	Do.
Los Angeles		2 to 6	3	James E. Jones, Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Colorado				
Fort Collins, Bessey Division	1902	1	1	Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.
Florida				
Lake Okeechobee	1930–36	2	1	U. S. Engineer Office, U. S. Courthouse and Post Office Bldg., Jacksonville, Fla.
Lake City Branch	1933–37	4	1	Southern Forest Experiment Station, Box 92, Lake City, Fla.
Idaho				
Garden Valley, Cascade, and vicinity.	1924–37, 1929–37	13, 8	[1] 4	W. B. Rice, forest supervisor, Payette National Forest, 210 Main St., Boise, Idaho.
Boise National Forest	1899–1937	38	[2] 3	G. B. Mains, supervisor, Boise National Forest, Boise, Idaho.
Idaho National Forest	1924	1	2	Idaho National Forest, McCall, Idaho.
Illinois				
Shawnee Purchase Unit	1936 [3]	1	1	U. S. Forest Service, Rosiclare, Ill.
Iowa				
Keokuk	1915–36	22	1	P. L. Mercer, Mississippi River Power Co., Keokuk, Iowa.
Louisiana				
Stuart Nursery	1935–37	2	1	Stuart Nursery, Pollock, La.
Massachusetts				
Milton	1885–1936	52	1	Charles F. Brooks, Blue Hill Observatory, Milton, Mass.

[1] 3 stations during season July to September.
[2] 1 station is seasonal.
[3] Established Aug. 1, 1936.

Central meteorologic stations—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Missouri				
St. Louis University, St. Louis.	----------	26	1	James Macelwane, St. Louis University, St. Louis, Mo.
Montana				
Deep Creek Range Station	1929–36 [4]	8	1	Forest supervisor, Bitterroot National Forest, Hamilton, Mont.
Moose Creek Range Station	1932–36 [4]	5	1	Do.
Oklahoma				
Kingfisher, Blaine, and Logan Counties.	1936	1	10	Soil Conservation Service, Washington, D. C.
Oregon				
Ochoco National Forest	1936 [5]	1	1	Ochoco National Forest, Prineville, Oreg.
Redwood Range Station	1934–36	3	1	Siskiyou National Forest, Grants Pass, Oreg.
Pennsylvania				
Lehigh University, Bethlehem.	1926–36	[6] 11	1	H. G. Payrow, Lehigh University, Bethlehem, Pa.
South Carolina				
Florence	1928–36	9	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Texas				
Substations of Texas Agricultural Experiment Station.	----------	6 to 48	18	A. B. Conner, Texas Agricultural Experiment Station, College Station, Tex.
Utah				
Myton	1916–36	21	1	U. S. Indian Irrigation Project, Myton, Utah.
Great Basin Branch Station	1915–36	21	3	Raymond Price, Intermountain Forest and Range Experiment Station, Ephraim, Utah.
Wasatch Branch Station, David County.	1936 [7]	1	2	A. R. Croft, Intermountain Forest and Range Experiment Station Bountiful, Utah.
Washington				
Bellingham	1928–37	9	5	Thomas H. Burgess, Forest Service, Bellingham, Wash.
Wisconsin				
Nicolet National Forest	1932–36, 1935–36	4, 1	2	U. S. Forest Service, Rhinelander, Wis.
Hayward and Butternut Nursery, and Hayward.	1930–36, 1935–36, 1936.	6, 2, 1	3	Chequamegon National Forest, Hayward, Wis.
Upper Mississippi Erosion Experiment Station.	1933–36	4	1	Lake States Forest Experiment Station, Box 643, La Crosse, Wis.

[4] May 1 to Sept. 30.
[5] Began in September.
[6] Approximate.
[7] Readings for 6 months.

ANEMOMETER AND WIND-VANE STATIONS

The following stations have records showing wind velocities for different periods.

Anemometer and wind-vane stations

Location	Years of record		Number of stations[1]	Official or agency
	Period covered	Length in years		
Alabama				
Montgomery	1936 [2]	1	3	U. S. Forest Service, Montgomery, Ala.
Arizona				
Globe	1935–36	1	1	Parker Creek Forest Influences Experimental Area, Box 443, Globe Ariz.
Prescott	1919–37	17	1	U. S. Forest Service, Prescott, Ariz.
Bill Williams Lookout	1923–36 [3]	13	1	W. G. Mann, Kaibab National Forest, Williams, Ariz.
Arkansas				
Crossett Experiment Forest	1936 [4]	1	1	Crossett Experiment Forest, Crossett, Ark.
Forest Service guard station	1930–36 [5]	7	2	U. S. Forest Service, Hot Springs, Ark.
California				
Los Angeles County	1934–36	2	2	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	1921–36	15	7	Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Santa Barbara	1935–37	2	1	U. S. Forest Service, Santa Barbara, Calif.
Frazier Mountain Lookout	1920–36 [6]	16	1	Houghton Durbrow, Santa Barbara National Forest, Santa Barbara, Calif.
California Forest Range Experiment Station.	1934–37 [7]	3	10	Forest supervisor, Stanislaus National Forest, Sonora, Calif.
Do	1931–36, 1932–36, 1934–36.[8]	5, 4, 2	6	Do.
Susanville Forest Nursery	1930–36	6	1	U. S. Forest Service, Susanville, Calif.
Klamath National Forest	1930–36 [9]	6	2	U. S. Forest Service, Yreka, Calif.
Stanislaus Branch Station	1934–36 [10]	2	1	E. I. Kotok, California Forest and Range Experiment Station, Berkeley, Calif.
San Joaquin Experimental Range, Madera County.	1934–36	2	1	Do.
Colorado				
Fort Collins, Bessey Division	1919–36	17	2	Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.
Cheyenne County	1936	1	1	Camp SCS–4–c, Cheyenne Wells, Colo.
Jefferson County	1935–36	2	1	Camp F–58–C, Golden, Colo.
Florida				
Lake Okeechobee	1928–36	8	5R	U. S. Engineer Office, U. S. Courthouse and Post Office, Jacksonville, Fla.

[1] R=Recording.
[2] August–September, anemometer only.
[3] May 15 to July 31.
[4] Last few weeks.
[5] Anemometer only.
[6] June to October.
[7] No wind vane; between frost periods only.
[8] No wind vane; 2 stations year long; 4 stations Apr. 1 to Nov. 15.
[9] June 1 to Oct. 10.
[10] Summer months only.

Anemometer and wind-vane stations—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Idaho				
Idaho City	1932–36	5	1	U. S. Weather Bureau, Missoula, Mont.
Do	1932–36 [11]	5	1	Do.
Boise National Forest	1934–37	3	2	G. B. Mains, Boise National Forest, Boise, Idaho.
Do	1899–1937	38	1R	Do.
Salmon	1934–37 [12]	3	1	U. S. Forest Service, Salmon, Idaho.
Tripod	1929–37	8	1	W. B. Rice, Payette National Forest, 210 Main St., Boise, Idaho.
Idaho National Forest	1935 [13]	1	2	Idaho National Forest, McCall, Idaho.
Intermountain Forest and Range Experiment Station.	1932–36 [14]	4	1	G. D. Pickford, U. S. Sheep Station Branch, Dubois, Idaho.
Illinois				
Chicago	1926–36	10	1R	Loran D. Gayton, City of Chicago, Bureau of Engineering, City Hall, Chicago, Ill.
Shawnee Purchase Unit	1936	1	1	U. S. Forest Service, Rosiclare, Ill.
Indiana				
Mitchell and Vallonia	1936	1	2	U. S. Forest Service, 7th St., Bedford, Ind.
Louisiana				
Bogalusa Branch	1932–34	2	1	Southern Forest Experiment Station, Bogalusa, La.
Stuart Nursery	1935–37	2	1	Stuart Nursery, Pollock, La.
Alexandria	1936–37	1	1	U. S. Forest Service, Alexandria, La.
Massachusetts				
Milton	1885–1936	51	1R	Charles F. Brooks, Blue Hill Observatory, Milton, Mass.
Do	1885–1936	51	1	Do.
Michigan				
Huron National Forest	1935–36 [15]	1	1	U. S. Forest Service, East Tawas, Mich.
Watersmeet Nursery	1936–37	1	1	U. S. Forest Service, Ironwood, Mich.
Manistee Purchase Unit, Mason County.	1935–36 [16]	1	1	U. S. Forest Service, Muskegon, Mich.
Minnesota				
Cass Lake	1918–36	18	1	U. S. Forest Service, Cass Lake, Minn.
Mississippi				
Jackson	1936 [17]	1	6	U. S. Forest Service, Jackson, Miss.
Harrison Experimental Forest	1934–36	2	1	Harrison Experimental Forest, Saucier, Miss.
Missouri				
Willow Springs	1936	1	1	Gardner Purchase Unit, U. S. Forest Service, 218½ West Walnut St., Springfield, Mo.
St. Louis University, St. Louis, Mo.		26	1	James Macelwane, St. Louis University, St. Louis, Mo.
Do		26	1R	Do.

[11] June 20 to Sept. 30.
[12] June 20 to Sept. 10.
[13] July 1 to Sept. 15.
[14] 6 months' season.
[15] 6 summer months.
[16] May to November 1935, June to October 1936.
[17] 6 weeks' record.

Anemometer and wind-vane stations—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Montana				
Bitterroot National Forest	1933-36 [18]	4	1R	Forest supervisor, Bitterroot National Forest, Hamilton, Mont.
Libby	1917-36	20	1	Forest supervisor, Kootenai National Forest, Libby, Mont.
Ermine Lookout	1936 [19]	1	1R	Deerlodge National Forest, Butte, Mont.
Absaroka National Forest [20]	1936	1	1	G. E. Martin, Absaroka National Forest, Livingston, Mont.
Daisy Peak	1936 [21]	1	1	David Lake, forest ranger, Harlowtown, Mont.
Belt Creek	1936 [22]	1	1	U. S. Forest Service, Neihart, Mont.
Deception Creek Experimental Forest.	1912-36	25	1	Stephen N. Wyckoff, Northern Rocky Mountain Forest and Range Experiment Station, Federal Bldg., Missoula, Mont.
Vigilante Experimental Range	1932-36	5	1	Do.
Iron Mountain, near Butte	1932-36 [11]	5	1	U. S. Weather Bureau, Missoula, Mont.
New Mexico				
Jornada Experiment Range [5]	1929-37	7	1	Jornada Experiment Range, Box 671, Las Cruces, N. Mex.
North Dakota				
Souris Basin [23]	1931-36	5	1	Lake State Forest Experiment Station, Forest Service, Denbigh, N. Dak.
Oklahoma				
Kingfisher, Blaine, and Logan Counties.	1936	1	153R	Soil Conservation Service, Washington, D. C.
Oregon				
Whitman National Forest	1914-37 [10]	23	22	R. E. Foote, Whitman National Forest, Baker, Oreg.
Do	1914-37 [10]	23	1R	Do.
Ochoco National Forest	1932-37 [23]	5	1	Ochoco National Forest, Forest Service, Prineville, Oreg.
Deschutes National Forest	June 1 to Sept. 30, 1936. [24]	1	15	Carl B. Neal, Deschutes National Forest, Bend, Oreg.
Do	June 1, 1935, to Oct. 15, 1936. [25]	1	2	Do.
Pendleton	1933-36	3	3	J. F. Irwin, Forest Service, Pendleton, Oreg.
Wallowa National Forest	1936	1	15	Rolland Huff, Wallowa National Forest, Enterprise, Oreg.
Do	1936	1	1R	Do.
Siuslaw National Forest	1930-36 [26]	7	26	R. S. Shelley, Siuslaw National Forest, Eugene, Oreg.
Upper Klamath Lake, Klamath Falls.	1932-36	4	1R	California-Oregon Power Co., Medford, Oreg.
Pennsylvania				
Lehigh University, Bethlehem.	1926-36 [27]	[27] 10	1	H. G. Payrow, Lehigh University, Bethlehem, Pa.
Utah				
Weber County	1935-36	2	1	Bureau of Reclamation, Ogden, Utah.
Washington				
Bellingham	1933-37	4	5	Thomas H. Burgess, U. S. Forest Service, Bellingham, Wash.
Do	1933-37 [21]	4	20	Do.
Republic	1926-36 [28]	10	14	A. D. Moir, U. S. Forest Service, Republic, Wash.
Do	1926-36 [28]	10	1R	Do.
Chelan National Forest	1935-36 [13]	2	24	P. T. Harris, Chelan National Forest, Okanogan, Wash.

[5] Anemometer only.
[10] Summer months only.
[11] June 20 to Sept. 30.
[13] July 1 to Sept. 15.
[18] May 1 to Sept. 30.
[19] July 1 to Aug. 31.
[20] Anemometer only. July 20 to Sept. 30.
[21] July 1 to Sept. 1.
[22] July 3 to Sept. 30.
[23] During fire season.
[24] Readings for 3 months.
[25] Readings for 8 months.
[26] June to September.
[27] Approximate.
[28] June 1 to Sept. 30.

Anemometer and wind-vane stations—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Washington—Contd.				
Snoqualmie National Forest	1936 [13]	1	9	John C. Kuhns, U. S. Forest Service, 524 Federal Office Bldg., Seattle, Wash.
Packwood	1934–36	2	1R	K. P. Cecil, Columbia National Forest, Box 60, Vancouver, Wash.
Dog Mountain lookout	1934–36 [29]	2	1R	Do.
Wisconsin				
Upper Mississippi Erosion Experiment Station.	1933–36 [5]	4	1	Lake States Forest Experiment Station, La Crosse, Wis.
Nicolet National Forest	1936 [30]	1	1	U. S. Forest Service, Rhinelander, Wis.

[5] Anemometer only.
[13] July 1 to Sept. 15.
[29] 34 Formonths' period.
[30] 2 months' record.

STANDARD UNITED STATES WEATHER BUREAU CLASS A EVAPORATION STATIONS

The stations listed below are complete with psychrometer, anemometer, thermometer, still well, hook gage, and recording rain gage.

Standard U. S. Weather Bureau Class A evaporation stations

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Arizona				
Roosevelt Dam [1]		25	1	T. A. Hayden, Salt River Valley Water Users' Association, P. O. Box 1980, Phoenix, Ariz.
San Carlos project [1]	1930–36	6	2	Paul F. Henderson, Office of Indian Affairs, 751 South Figueroa St., Los Angeles, Calif.
California				
	1925–36 [1]	11	4	Pacific Gas & Electric Co., 245 Market St., San Francisco, Calif.
	1932–36 [1]	4	2	Do.
	1930–36 [1]	7	1	Morris S. Jones, City of Pasadena Water Department, 319 City Hall, Pasadena, Calif.
	1934–36		1	Metropolitan Water District of Southern California, 306 West 3d St., Los Angeles, Calif.
Southern California	1934–36 [1]	3	1	F. E. Weymouth, Metropolitan Water District of Southern California, Los Angeles, Calif.
Idaho				
Boise National Forest	1916–37 [2]	21	1	G. B. Mains, supervisor, Boise National Forest, Boise, Idaho.
Louisiana				
Baton Rouge [3]	1933–36	4	1	Glen N. Cox, Louisiana State University, Baton Rouge, La.
Nevada				
Walker River project		1	1	Paul F. Henderson, Office of Indian Affairs, 751 South Figueroa St., Los Angeles, Calif.
Elko	1919, 1926, 1930–36.	13	1	U. S. Forest Service, Elko, Nev.
Oklahoma				
Stillwater	1931–36	6	1	Dean of Agriculture, Oklahoma Agricultural and Mechanical College, Stillwater, Okla.
Utah				
Myton	1920–36	17	1	U. S. Indian Irrigation Service, Myton, Utah.

[1] Additional information requested.
[2] April to September.
[3] Anemometer, evaporation vessel, and rain gage only.

NONSTANDARD EVAPORATION STATIONS

The stations listed below are equipped with nonstandard evaporation pans.

Nonstandard evaporation stations

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Arizona				
United States Field Station, Sacaton.	----------	18	1	C. T. King, United States Field Station, Sacaton, Ariz.
Globe	1936	1	1	Parker Creek Forest Influences Experimental Area, Box 443, Globe, Ariz.
California				
Near Tule Lake	1924–36	12	1	Bureau of Reclamation, Klamath Falls, Oreg.
Dutton Island, Suisun Bay.	May 1 to Oct. 10, 1936.	1	1	District Engineer, U. S. Engineers Office, 401 Customhouse, San Francisco, Calif.
Vicinity of Pasadena	1930–36	6	1	Morris S. Jones, Pasadena Water Department, Room 319, City Hall, Pasadena, Calif.
Los Angeles County	1921–36	15	11	Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Do	1929–30	1	1	C. H. Howell, Los Angeles County Flood Control District, 205 Broadway, Los Angeles, Calif.
Do	1930–31	1	4	Do.
Do	1931–32	1	20	Do.
Do	1932–33	1	25	Do.
Do	1933–34	1	25	Do.
Do	1934–35	1	25	Do.
Do	1935–36	1	23	Do.
Santa Barbara	1935–37	2	2	U. S. Forest Service, Star Route, Santa Barbara, Calif.
Burgess Spring Experimental Range, Lassen County.	June to October 1936.	1	1	E. I. Kotok, California Forest and Range Experiment Station, Berkeley, Calif.
Black's Mountain Experimental Forest, Lassen County.	June to October 1936.	1	1	Do.
Colorado				
Fort Collins, Bessey Division.	1923–36	13	2	Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.
Florida				
Lake Okeechobee	1934–36	2	1	U. S. Engineer Office, United States Courthouse and Post Office Bldg., Jacksonville, Fla.
Idaho				
Boise National Forest	Unknown	----------	2	G. B. Mains, Boise National Forest, Boise, Idaho.
Kansas				
Tribune	1921–35	14	1	L. E. Call, Manhattan, Kans.
Garden City	1908–36	28	1	Do.
Massachusetts				
Milton	1885–1936	51	1	Charles F. Brooks, Blue Hill Observatory, Milton, Mass.
New Mexico				
Jornada Experiment Range.	1929–36	7	1	Jornada Experiment Range, Box 671, Las Cruces, N. Mex.
Oregon				
Medford Experiment Station.	----------	[1] 4	1	R. A. Work, Medford Experiment Station, Medford, Oreg.
United States Umatilla Field Station.	----------	[1] 6	1	United States Umatilla Field Station, Hermiston, Oreg.
Upper Klamath Lake, Klamath Falls.	1921–36	15	1	California-Oregon Power Co., Medford, Oreg.

[1] Approximate.

SNOW-MEASUREMENT STATIONS

The following stations have obtained measurements of snowfall:

Snow-measurement stations

Location	Years of record		Number of stations [1]	Official or agency
	Period covered	Length in years		
Arizona				
McNary		6	1	T. A. Hayden, Salt River Valley Water Users' Association, P. O. Box 1980, Phoenix, Ariz.
Globe	1933–36	3	1	Parker Creek Forest Influences Experimental Area, Box 443, Globe, Ariz.
Prescott	1919–36	17	1	U. S. Forest Service, Prescott, Ariz.
Arkansas				
United States Forest Service guard stations.	1930–36	7	1	U. S. Forest Service, Hot Springs, Ark.
California				
Placer County	1910–36	26	6C	University of Nevada Agricultural Experiment Station, Reno, Nev.
Eldorado County	1913–36	23	5C	Do.
Alpine County	1916–36	20	7C	Do.
Mono County	1916–36	20	8C	Do.
Nevada County	1913–36	23	1C	W. W. McLaughlin, Bureau of Agricultural Engineering, Berkeley, Calif.
Alpine County	1916–36	20	1C	Do.
Along Owens River aqueduct system and in Los Angeles area.	1926–36	10	12C	Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Yosemite National Park	[2] 1926–36	10	10C	Superintendent, Yosemite National Park, Calif.
Los Angeles County	1900–1910	10	16	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	1910–20	10	41	Do.
Do	1890–1900	10	1	Do.
Fresno County	1930–36	6	3	Fred G. Hamilton, Southern California Edison Co., P. O. Box 135, Los Angeles, Calif.
Placer County	1910–36	27	5C	University of Nevada Agricultural Experiment Station, Reno, Nev.
Eldorado County	1913–36	24	4C	Do.
Alpine County	1916–36	21	6C	Do.
Mono County	1916–36	21	4C	Do.
Sierra County	1922–36	14	3C	Do.
Nevada County	1927–36	9	2C	Do.
Los Angeles County	1920–30	10	24	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	1930–36	6	40	Do.
Alpine County	1930–36	7	5	Edward Hyatt, State Department of Public Works, Sacramento, Calif.
Institute of Forest Genetics	1927–36	10	1	E. I. Kotok, California Forest and Range Experiment Station, Berkeley, Calif.
Colorado				
Colorado River Basin	1936	1	23	Bureau of Reclamation, Customhouse, Denver, Colo.
Elbert County	1935–36	2	4	Camp SCS–9–C, Elbert, Colo.
San Miguel County	1936	1	1	Camp DG–11–C, Redvale, Colo.
Las Animas County	1936	1	4	Camp SCS–1–C, Trinidad, Colo.
Jefferson County	1935–36	2	1	Camp F–58–C, Golden, Colo.
Fort Collins, Bessey Division	1919–37	18	2	Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.
Idaho				
Headwaters of Henrys Fork of Snake River.	1935–36	2	3	Bureau of Reclamation, Ashton, Idaho.
Jackson Lake drainage area		18	9	Do.
	1936 [3]	1	5	U. S. Office of Indian Affairs, Fort Hall, Idaho.

[1] C=Snow courses.
[2] Data more accurate and complete, 1930–36.
[3] Additional information requested.

Snow-measurement stations—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Idaho—Continued				
Boise County		6	1 C	W. W McLaughlin, Bureau of Agricultural Engineering, Berkeley, Calif.
Elmore County		6	2 C	Do.
Custer County		11	2 C	Do.
Shoshone County	(4)	8	6 C	Do.
Kootenai County	(4)	8	3 C	Do.
Northern Idaho		22	3	J. D. Wood, Idaho State Planning Board, Boise, Idaho.
Southwestern Idaho		27	6	Do.
Southeastern Idaho		4	2	Do.
Northern Idaho	1891–1936 [5]	46	26	Do.
Southwestern Idaho	1898–1936	39	42	Do.
Southeastern Idaho	1895–1936	42	28	Do.
Targhee National Forest	1927–37 [6]	10	6	S. C. Scribner, supervisor, Targhee National Forest, St. Anthony, Idaho.
Salmon	1935–36 [7]	1	1	U. S. Forest Service, Salmon, Idaho.
Salmon	1937 [8]	1	1	Do.
Lemhi (Challis) National Forest.	1915–36	22	1	E. E. McKee, supervisor, Lemhi (Challis) National Forest, McKay, Idaho.
Do	1925–36 [9]	12	3 C	Do.
Payette National Forest	1918–37	19	15	W. B. Rice, supervisor, Payette National Forest, 210 Main St., Boise, Idaho.
Boise National Forest	1932–37	5	11	C. B. Mains, supervisor, Boise National Forest, Boise, Idaho.
Idaho National Forest	1936–37	1	3	Idaho National Forest, McCall, Idaho.
Intermountain Forest and Range Experiment Station.	1930–36 [10]	6	100	G. D. Pickford. United States Sheep Station Branch, Dubois, Idaho.
Iowa				
Kossuth	1936	1	1	Camp D–3, Bancroft, Iowa.
Kansas				
Coffey County	1935–36	2	3	Camp SCS–7, Burlington, Kans.
Maryland	(3)	8	1	
Massachusetts				
Milton	1885–1936	52	1	Charles F. Brooks, Blue Hill Observatory, Milton, Mass.
Michigan				
Upper Michigan National Forest.	1936	1	11	U. S. Forest Service, Escanaba, Mich.
Minnesota				
Winton, Warroad, and Winnibigoshish Dams.	1929–36	8	3 C	U. S. Engineer Office, Duluth, Minn.
Mississippi				
Vicinity of Meridian	1935–36	2	2	Soil Conservation Service, Meridian, Miss.
Missouri				
Along Continental Divide in upper Missouri River Basin above Fort Peck Dam.	1934–36	3	22	Division Engineer, Missouri River Division, 707 Postal Telegraph Bldg., Kansas City, Mo.
Lewis County	1936	1	1	Camp D–1, Canton, Mo.
Montana				
Kootenai National Forest	[9] 1936	1	10	Forest supervisor, Kootenai National Forest, Libby, Mont.
Libby	1917–36	20	1	Do.
Deerlodge National Forest	[11] 1935	1	1	Forest supervisor, Department of Agriculture, Butte, Mont.

[3] Additional information requested.
[4] Courses established in 1928.
[5] Period covered is maximum record for the group.
[6] December to March.
[7] December to January.
[8] February to March.
[9] Winter months.
[10] Readings once a year just before melting.
[11] Monthly readings Oct. 1 to June 30.

Snow-measurement stations—Continued

Location	Years of record: Period covered	Years of record: Length in years	Number of stations	Official or agency
Montana—Continued				
Sun River district	[12] 1913–37	24	53	U. S. Forest Service, Augusta, Mont.
Chouteau	1890–1937	47	1	U. S. Forest Service, Chouteau, Mont.
Lolo National Forest	[13] 1934–36	3	4	E. H. Myrick, Lolo National Forest, Missoula, Mont.
Northern Rocky Mountain Forest and Range Experiment Station.	1935	1	3	Stephen N. Wyckoff, Federal Bldg., Missoula, Mont.
Sun River district	1913–36	23	53	B. P. Martin, Sun River district, Augusta, Mont.
Glacier National Park	[14] 1932–36	4	1	Superintendent, Glacier National Park, Mont.
Cabinet National Forest	1911–37	26	4	A. H. Abbott, Cabinet National Forest, Thompson Falls, Mont.
Bitterroot National Forest	[15] 1924–36	13	2	Forest supervisor, Bitterroot National Forest, Hamilton, Mont.
Nevada				
Elko County	1919–36	18	25 C	University of Nevada, Agricultural Experiment Station, Reno, Nev.
Humboldt County	1919–36	18	6 C	Do.
Washoe County	1910–36	27	4 C	Do.
Ormsby County	1915–36	22	3 C	Do.
Douglas County	1916–36	21	1 C	Do.
Elko County	1919–36	17	24 C	W. W. McLaughlin, Bureau of Agricultural Engineering, Berkeley, Calif.
Humboldt County	1919–36	17	6 C	Do.
New Jersey				
Newark	1892–1936	45	1	William Wiener, Central High School, Newark, N. J.
New Mexico				
Bernalillo County	1935–36	2	1	Camp SCS–9–N, Albuquerque, N. M.
Valencia County	1935–36	2	1	Camp SCS–10–N, Grants, N. M.
New York				
Voorheesville	1915–36	22	1	Robert E. Horton, Voorheesville, N. Y.
North Carolina				
Coweeta, Copper Basin	1934–36	3	75	U. S. Forest Service, Asheville, N. C.
Ohio				
Muskingum drainage basin	1936	1	15	Waldo E. Smith, Muskingum Watershed Conservancy District, New Philadelphia, Ohio.
Oklahoma				
Stillwater	1931–36	6	1	Dean of Agriculture, Oklahoma Agricultural and Mechanical College, Stillwater, Okla.
Oregon				
----------	----------	[16] 8	8	R. A. Worls, Medford Experiment Station, Medford, Oreg.
----------	----------	[16 17] 7	1	C. A. Mitchell, Pendleton Field Station, Pendleton, Oreg.
Upper Klamath Lake	1926–36	11	13	California-Oregon Power Co., Medford, Oreg.
----------	----------	[16] 9	72	C. E. Stricklin, State Engineer, Salem, Oreg.
Owyhee River drainage basin above Owyhee Reservoir.	1935–36	2	16	Bureau of Reclamation, Owyhee Project, Ontario, Oreg.
Baker County	1929–36	7	3C	W. W. McLaughlin, Bureau of Agricultural Engineering, Berkeley, Calif.
Grant County	1929–36	7	2 C	Do.
Wallowa County	1929–36	7	1 C	Do.
Umatilla County	1928–36	8	3 C	Do.

[12] Nov. 1 to May 31.
[13] Dec. 1 to Apr. 1.
[14] Observations made on valley floors midway between head and foot, and at head of valleys in each ranger district.
[15] Nov. 1 to Apr. 1.
[16] Additional information requested.
[17] Approximate.

Snow-measurement stations—Continued

Location	Years of record: Period covered	Years of record: Length in years	Number of stations	Official or agency
Oregon—Continued				
Morrow County	1928–36	8	1C	W. W. McLaughlin, Bureau of Agricultural Engineering, Berkeley, Calif.
Lane County	1929–36	7	1C	Do.
Deschutes County	1928–36	8	1C	Do.
Crook County	1928–36	8	1C	Do.
Wasco County	1931–36	5	1C	Do.
Klamath County	1929–36	7	3C	Do.
Jackson County	1929–36	7	2C	Do.
Crater Lake National Park	1929–36	7	1C	Do.
Owyhee River drainage basin above Owyhee Reservoir.	1935–36	2	16	Bureau of Reclamation, Ontario, Oreg.
Whitman National Forest	1914–37	24	4	R. E. Foote, Whitman National Forest, Baker, Oreg.
Ochoco National Forest [18]	[19] 1922–37	15	4	Ochoco National Forest, Prineville, Oreg.
Deschutes National Forest	1929–36	7	1	Deschutes National Forest, Bend, Oreg.
Pendleton	1916–36	20	5	J. F. Irwin, U. S. Forest Service, Pendleton, Oreg.
Wallowa National Forest	1928–37	9	1	Rolland Huff, Wallowa National Forest, Enterprise, Oreg.
Pennsylvania				
Distributed throughout Pennsylvania, principally in central portion of State.	1936	1	69C	F. A. Pitkin, Pennsylvania State Planning Board, 928 North 3d St., Harrisburg, Pa.
Texas				
College Station	----------	6–48	19	A. B. Conner, Texas Agricultural Experiment Station, College Station, Tex.
Johnson County	1936	1	2	Camp SP–53–T, Cleburne, Tex.
Reeves County	1936	1	2	Camp SP–47, Balmorhea, Tex.
Utah				
Northeastern, southeastern, and southwestern Utah	[20] 1930–36	7	84C	George D. Clyde, Bureau of Public Roads, Logan, Utah.
Davis County	----------	2	5C	A. R. Croft, Wasatch Branch Station, Bountiful, Utah.
Great Basin Branch Station	1930–36	6	3	Raymond Price, Intermountain Forest and Range Experiment Station, Ephraim, Utah.
Wasatch Branch Station, David County.	1934–36	2	100	A. R. Croft, Intermountain Forest and Range Experiment Station, Bountiful, Utah
Bear River, Fish Lake, Gooseberry and Chalk Creek	[21] 1930–36, 1931–36, 1932–36	4, 6, 5	4	C. A. Mattsson, U. S. Forest Service, Richfield, Utah.
Garden City Canyon and Emigration Canyon.	[22] 1930–36, 1935–36	6, 1	2	Cache National Forest, Logan, Utah.
Washington				
Headwaters of Chelan River Basin in Cascade Range.	1927–36	[17] 10	18	A. J. Turner, Washington Water Power Co., Spokane, Wash.
Headwaters of Spokane River Basin in Bitterroot Mountains.	1927–36	[17] 10	10	Do.
Yakima County	1936	1	6	Camp SCS–W–6, Yakima, Wash.
Whitman County	1935–36	2	1	Camp SCS–W–2, Pullman, Wash.
Bellingham	[23] 1926–37	11	1	Thomas H. Burgess, U. S. Forest Service, Bellingham, Wash.
Chelan National Forest	[24] 1933–36	4	2	P. T. Harris, Chelan National Forest, Okanogan, Wash.
Wyoming				
Teton County	----------	18	4C	W. W. McLaughlin, Bureau of Agricultural Engineering, Berkeley, Calif.
Yellowstone National Park	----------	18	5C	Do.

[17] Approximate.
[18] No forest record; reports sent direct to regional forester.
[19] Dec. 1 to Mar. 31.
[20] Records for 9 courses from 1924 to 1936.
[21] Readings made Apr. 1 each year.
[22] Readings made in March each year.
[23] Nov. 1 to June 30.
[24] Nov. 1 to Apr. 1.

GROUND-WATER OBSERVATION WELLS

The stations listed below have obtained data on ground-water observation wells for the periods indicated.

Ground-water observation wells

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Arizona				
San Carlos irrigation project	1934–36	3	[1] 3	C. J. Moody, San Carlos Irrigation Project, Coolidge, Ariz.
Do	1934–36	3	80	Do.
United States field station, Sacaton.	1916–36	21	20	C. J. King, United States Field Station, Sacaton, Ariz.
Salt River project		16	[2] 600	T. A. Hayden, Salt River Valley Water Users' Association, P. O. Box 1980, Phoenix, Ariz.
Yuma project	1911–36	25	212	R. C. E. Weber, U. S. Bureau of Reclamation, Yuma, Ariz.
Prescott	1919–36	17	1	U. S. Forest Service, Prescott, Ariz.
Arkansas				
Rice Branch Experiment Station	1936	1	[1] 4	G. H. Banks, University of Arkansas, Fayetteville, Ark.
California				
Along Owens River aqueduct system and in Los Angeles area.	1925–36	11	[1] 54	Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Do	1922–36	14	1, 139	Do.
San Gabriel Valley	1930–36	6	[1] 16	W. H. Stevens, 2505 East Whittier Bldg., Whittier, Calif.
Do	1930–36	6	100	Do.
Yosemite National Park, Wawona Airport.	1935	1	5	Superintendent, Yosemite National Park, Calif.
Central Valley of California	1916–35	20	3, 290	Edward Hyatt, State Division of Water Resources, 401 Public Works Bldg., Sacramento, Calif.
Riverside County	1930–36 [2]	[2] 7	[2] 500	F. E. Weymouth, Metropolitan Water District of Southern California, Los Angeles, Calif.
Vicinity of Pasadena	1926–36	11	4	Morris S. Jones, City of Pasadena Water Department, Room 319, City Hall, Pasadena, Calif.
Santa Clara and San Mateo Counties.	1930–36	7	[1] 5	A. L. Trowbridge, Stanford University, Calif.
Do	1930–36	7	30	Do.
Los Angeles County	1933–36	3	[1] 2	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	1929–36	7	[2] 3, 200	Do.
Adjacent to San Joaquin River in Stanislaus County.	1932–33	2	550	Fred G. Hamilton, Southern California Edison Co., P. O. Box 135, Los Angeles, Calif.
Vicinity of Long Beach		[2] 7	[1] 8	Fred S. Porter, Long Beach Water Department, 308 Municipal Utilities Bldg., Long Beach, Calif.
Do		[2] 2	[1] 10	Do.
Do		[2] 13	20	Do.
Zone of influence of San Gabriel River below Whittier Narrows.		3	40	Do.
Santa Barbara	1935–37	2	[1] 1	U. S. Forest Service, Star Route, Santa Barbara, Calif.
Do	1935–37	2	10	Do.
Los Angeles		2 to 6	19	James E. Jones, Department of Water and Power, 207 South Broadway, Los Angeles, Calif.

[1] Wells equipped with recorder.
[2] Approximate.

Ground-water observation wells—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Florida				
Lake Okeechobee	1935-36	2	[1] 5	U. S. Engineer Office, U. S. Courthouse and Post Office Bldg., Jacksonville, Fla.
Marion and Putnam Counties and vicinity.	1932-36	5	243	Do.
Lake City Branch	1935-37	2	24	Southern Forest Experiment Station Box 92, Lake City, Fla.
Illinois				
Near Kampsville	April to June 1934, March to August 1935.	1	27	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Near Bluffdale	1936	1	10	Do.
Near Pearl	1932-33	2	9	Do.
Do	1932-33	2	2	Do.
Near Florence	1932-33	2	7	Do.
Near Meredosia	1932-33	2	11	Do.
Vicinity of Carmon	1930-36	7	14	P. L. Mercer, Mississippi River Power Co., Keokuk, Iowa.
Between a point above Savanna, Ill. (mile 547) and a point above Louisiana, Mo. (mile 291).	1935-36 [3]	2	230	U. S. Engineer Office, Rock Island, Ill.
Do	1936	1	[4] 20	Do.
Near Hardin	1932-34	3	8	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Do	April to June 1934, March to August 1935.	1	23	Do.
Near Kampsville	1933-34	2	8	Do.
Indiana				
Kankakee basin	1923-29	7	160	Denzil Doggett, Indiana Department of Conservation, Indianapolis, Ind.
Riverside Pumping Station, Indianapolis.	1935-36	2	1	W. C. Mabee, Indianapolis Water Co., 113 Monument Circle, Indianapolis, Ind.
Iowa				
Between Guttenberg, Iowa, and Clarksville, Mo.	1932-35 [2]	5	[5] 47	U. S. Engineer Office, Rock Island, Ill.
Kansas				
Scott County	1931-36	6	[1] 1	G. S. Knapp, Kansas State Board of Agriculture, Statehouse, Topeka, Kans.
Do	1934-36	3	[1] 1	Do.
Do	1936	1	[1] 6	Do.
Wichita	1934-36	2	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Michigan				
Roscommon County	1934-36	3	1	Allerd W. Bergquist, Michigan Emergency Conservation Work, 522 Mutual Bldg., Lansing, Mich.
Missaukee, Roscommon, Ogemaw, Crawford, Kalkaska, Grand Traverse, Otsego, Montmorency, Presque Isle, and Cheboygan Counties.	1934-36	3	400	Do.
Huron National Forest	1935-36 [6]	1	50	U. S. Forest Service, East Tawas, Mich.

[1] Wells equipped with recorder.
[2] Approximate.
[3] Period c readings.
[4] Gages are open pipes about 8 feet in length. The water surface levels in these wells are determined intermittently by field survey parties.
[5] 7 wells added during the period 1932-36. Gages read daily.
[6] Yearly readings.

Ground-water observation wells—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Minnesota				
Peat swamps of central and northern Minnesota.	1934–36	3	[1] 7	Walter S. Olson, State of Minnesota Department of Conservation, St. Paul, Minn.
Do	1926–36	11	15	Do.
Do	1931–36	6	50	Do.
South St. Paul	1930–36	7	40	U. S. Engineer Office, 615 Commerce Bldg., St. Paul, Minn.
Do	1935–36	2	32	Do.
Wabasha	1931–36	6	14	Do.
Winona	1932–36	5	17	Do.
Chippewa National Forest	1930–36	6	1	U. S. Forest Service, Cass Lake, Minn.
Mississippi				
Stoneville	1930–36	7	3	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Do	1936	1	9	Do.
Do	1930–36	6	[7] 9	Do.
Vicinity of Meridian	1935–36	2	[1] 1	Soil Conservation Service, Meridian, Miss.
Do	1934–36	3	54	Do.
Missouri				
Near Oasis	1935–36	2	6	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Near Elsberry	1935–36	2	73	Do.
Nevada				
Elko	1934–36	2	14	U. S. Forest Service, Elko, Nev.
New York				
Voorheesville	1915–36 [2]	[2] 22	3	Robert E. Horton, Voorheesville, N. Y.
North Carolina				
Coweta	1936	1	[1] 1	U. S. Forest Service, Asheville, N. C.
Do	1936	1	6	Do.
Do	1935–36	2	13	Do.
North Dakota				
Souris Basin	1931–36 or 1933–36.	5 or 3	10	Lake States Forest Experiment Station, U. S. Forest Service, Denbigh, N. Dak.
Oregon				
Old district lands of Owyhee project.	1931–36	6	147	Bureau of Reclamation, Ontario, Oreg.
Willamette Valley	1935–36	2	120	War Department, District Engineer, 306 Customhouse, Portland, Oreg.
Utah				
Weber County	1932–36	5	[1] 5	Bureau of Reclamation, Ogden, Utah.
Washington				
Yakima project	1906–12 [8]	7	186	Bureau of Reclamation, Yakima, Wash.
Spokane River Valley between Spokane, Wash., and Post Falls, Idaho.	1930–36	7	20	A. J. Turner, Washington Water Power Co., Spokane, Wash.
Wisconsin				
Cochrane	1934–36	3	28	U. S. Engineer Office, 615 Commerce Bldg., St. Paul, Minn.

[1] Wells equipped with recorder.
[2] Approximate.
[7] Wells located on about 800 acres of farm land.
[8] Records not complete for entire period covered.

LAKE AND RESERVOIR STATIONS

The following stations have obtained measurements of stages of lakes and reservoirs.

Lake and reservoir stations

Location	Years of record: Period covered	Years of record: Length in years	Number of stations	Official or agency
Arizona				
San Carlos Reservoir	1929–36	8	1	C. J. Moody, San Carlos Irrigation Project, Coolidge, Ariz.
Roosevelt Dam	1911–36	25	1	T. A. Hayden, Salt River Valley Water Users' Association, P. O. Box 1980, Phoenix, Ariz.
Cave Creek Flood Control Dam.	1923–36	13	1	Do.
Mormon Flat Dam	1925–36	11	1	Do.
Horse Mesa Dam	1927–36	9	1	Do.
Stewart Mountain Dam	1930–36	6	1	Do.
Greenlee County	1935–36	2	11	Camp SCS–A–1, Duncan, Ariz.
Arkansas				
Arkansas County	1936	1	2	Camp BF–1, St. Charles, Ark.
California				
Devils Gate Dam	1921–30	10	1	Morris S. Jones, City of Pasadena Water Department, Room 319, City Hall, Pasadena, Calif.
Morris Dam	1934–36	3	1	Do.
Santa Clara and San Mateo Counties.	1929–36	8	3	A. L. Trowbridge, Stanford University, Calif.
Los Angeles County	1920–22 [1]	2	1	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
		[2] 9 to 12	3	Fred G. Hamilton, Southern California Edison Co., P. O. Box 135, Los Angeles, Calif.
Do	1913–36	23	20	Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Do	1922–27 [1]	5	2	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	1927–28 [3]	1	3	Do.
Do	1928–29 [3]	1	6	Do.
Do	1929–30 [3]	1	7	Do.
Do	1930–31 [3]	1	8	Do.
Do	1931–35 [3]	4	12	Do.
Do	1935–36 [3]	1	13	Do.
Mendocino County	1906–36	30	1	P. M. Downing, Pacific Gas & Electric Co., San Francisco, Calif.
Lake County	1906–36	30	1	Do.
Shasta County	1906–36	30	10	Do.
Butte County	1906–36	30	5	Do.
Yuba County	1906–36	30	2	Do.
Nevada County	1906–36	30	16	Do.
Placer County	1906–36	30	12	Do.
Alpine County	1906–36	30	5	Do.
Amador County	1906–36	30	7	Do.
Eldorado County	1906–36	30	4	Do.
Plumas County	1906–36	30	2	Do.
Tuolumne County	1906–36	30	5	Do.
Santa Barbara	1935–37	2	2	U. S. Forest Service, Star Route, Santa Barbara, Calif.
Los Angeles		2 to 24	4	James E. Jones, Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Colorado				
Pueblo	1921–36	15	44	F. J. Poch, supervisor, U. S. Forest Service, Pueblo, Colo.
Florida				
Lake Okeechobee	1932–36	5	40	U. S. Engineer Office, U. S. Courthouse and Post Office Bldg., Jacksonville, Fla.

[1] Records incomplete.
[2] Additional information requested.
[3] Daily stage inflow and outflow.

Lake and reservoir stations—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Georgia				
Georgia Power Co. lakes	1933-36	3	7	U. S. Forest Service, Gainesville, Ga.
Idaho				
Jackson Lake, American Falls, and Lake Walcott Reservoir.		9 to 18	3	Dana Templin, Bureau of Reclamation, Burley, Idaho.
Blackfoot Dam and Beaver Tail Point.	1910-36	27	2	U. S. Office of Indian Affairs, Fort Hall, Idaho.
Coeur d'Alene Lake	1927-36 [4]	[4] 26	1	A. J. Tumes, Washington Water Power Co., Spokane, Wash.
Garden Valley	1924-37	13	1	W. B. Rice, Payette National Forest, 210 Main St., Boise, Idaho.
Boise National Forest	October 1917 to 1937.	20	1	G. B. Mains, Boise National Forest, Boise, Idaho.
Idaho National Forest	1910-37	27	1	Idaho National Forest, McCall, Idaho.
Illinois				
Oquawka and Dallas City	1913-36 [4]	[4] 24	2	P. L. Mercer, Mississippi River Power Co., Keokuk, Iowa.
Bloomington Reservoir, McLean County.	1930-36	7	1	Illinois State Water Supply Division, Urbana, Ill.
Carbondale Reservoir, Jackson County.	1929-36	8	1	Do.
Centralia Reservoir, Marion County.	1926-36	11	1	Do.
Lake Bracken Reservoir, Knox County.	1929-36	8	1	Do.
Staunton Reservoir, Macoupin County.	1929-36	8	1	Do.
West Frankfort Reservoir, Franklin County.	1928-36	9	1	Do.
Iowa				
Fort Madison and Keokuk	1913-36 [4]	[4] 24	2	P. L. Mercer, Mississippi River Power Co., Keokuk, Iowa.
Kansas				
Leavenworth County State Lake, Ottawa County State Lake, Scott County State Lake, and Finney County State Lake.	1932-36 [4]	[4] 5	4	G. S. Knapp, Kansas State Board of Agriculture, Statehouse, Topeka, Kans.
Minnesota				
Lake of the Woods, Warroad	1929-36	8	1	U. S. Engineer Office, Duluth, Minn.
Montana				
Lake Como	1908-36 [5]	28	1	N. W. Blindauer, Bitterroot Irrigation District, Hamilton, Mont.
Chouteau	1916-37	21	1	U. S. Forest Service, Chouteau, Mont.
Nevada				
Rye Patch Reservoir	1936	1	1	L. J. Foster, Bureau of Reclamation, Lovelock, Nev.
New Jersey				
Raymond Dam, Wanaque	1928-36 [4]	[4] 9	2	Crystal Brown, North Jersey District Water Supply Commission, Wanaque, N. J.
Oradell and Woodcliff Reservoirs.	1921-36	16	2	Hackensack Water Co., Weehawken, N. J.
New Mexico				
Avalon Reservoir		30	1	L. E. Foster, U. S. Bureau of Reclamation, Carlsbad, N. Mex.
Lake McMillan		30	1	Do.

[4] Approximate.
[5] Daily records, Apr. 1 to Oct. 1; monthly records, Oct. 1 to Apr. 1.

Lake and reservoir stations—Continued

Location	Years of record		Number of stations	Official or agency
	Period covered	Length in years		
Oregon				
Clear Lake Reservoir	1910-36	27	1	Bureau of Reclamation, Klamath Falls, Oreg.
Gerber Reservoir	1925-36	12	1	Do.
Wallowa National Forest	1914-37	13	1	Rolland Huff, Wallowa National Forest, Enterprise, Oreg.
Pennsylvania				
Fayette County		10	1	James E. Stewart, West Penn Power Co., 14 Wood St., Pittsburgh, Pa.
South Dakota				
Belle Fourche Reservoir	1912-36	15	1	Bureau of Reclamation, Newell, S. Dak.
Utah				
Bear Lake	1913-36	24	1	Utah Power & Light, Co., Salt Lake City, Utah.
Yakima project	1915-36	22	1	Bureau of Reclamation, Yakima, Wash.
Chelan and Long Lakes	1927-36 [4]	[4] 26	2	A. J. Turner, Washington Water Power Co., Spokane, Wash.
Lake Washington	1901-15	15	1	U. S. Engineer Office, 412 Federal Office Bldg., Seattle, Wash.
Wyoming				
Pilot Butte Reservoir	1929-36	8	1	Bureau of Reclamation, Riverton, Wyo.
Shoshone Reservoir	1913-36	24	1	Do.

[4] Approximate.

STREAM-GAGING STATIONS

The following stations obtained measurements of streams with staff, recording, wire-weight, or chain gages.

Stream-gaging stations

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Alabama					
Warrior River at locks 5-9, Black Warrior River at Palos and locks 11-17.	Staff gage	1895-1936	42	17	U. S. Engineer Office, Mobile, Ala.
Arizona					
Graham County	do	1936	1	2	Camp SCS-10-A, Fort Thomas, Ariz.
Colorado River near Laguna Dam.	do	1909-36	28	2	R. C. E. Weber, Bureau of Reclamation, Yuma, Ariz.
Colorado River at Yuma	do	1878-1927	50	1	Do.
Globe	Recording gage	1934-36	2	7	Parker Creek Forest Influences Experimental Area, Box 443, Globe, Ariz.
Arkansas					
St. Francis River at St. Francis.	Staff gage	Oct. 26, 1916, to 1936.	20	1	U. S. Engineer Office, Memphis, Tenn.
St. Francis River at Lake City.	do	Oct. 6, 1916, to 1936.	20	1	Do.
St. Francis River at Deep Landing.	do	Nov. 12, 1916, to 1936.	20	1	Do.
St. Francis River at Oak Donic.	do	Oct. 29, 1915, to 1936.	21	1	Do.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Arkansas—Continued					
L'Anguille River at Marianna.	Staff gage	January 1911 to 1936.	26	1	U. S. Engineer Office, Memphis, Tenn.
Current River at Biggers	do	July 17, 1918, to 1936.	18	1	Do.
Black River at Corning	do	July 27, 1918, to 1936.	18	1	Do.
Black River at Scaggs Ferry.	do	July 21, 1918, to 1936.	18	1	Do.
Black River at Pocahontas.	do	July 18, 1918, to 1936.	18	1	Do.
White River at Oneal	do	Dec. 11, 1907, to 1936.	29	1	Do.
White River at Bethesda	do	Nov. 4, 1904, to 1936.	32	1	Do.
White River at Aberdeen	do	Mar. 2, 1932, to 1936.	5	1	Do.
White River at St. Charles.	do	June 3, 1932, to 1936.	5	1	Do.
Spring River at Imboden	do	Feb. 20, 1936, to date.	1	1	Do.
Strawberry River, 12 miles south of Williford.	do	Feb. 23, 1936, to date.	1	1	Do.
Eleven Point River at Eleven Point.	do	Feb. 25, 1936, to date.	1	1	Do.
Little Red River at Heber Springs.	do	Mar. 3, 1936, to date.	1	1	Do.
Fourche La Fave at Nimrod.	do	March 1929 to August 1932.	4	1	Do.
Arkansas River at Big Bayou Meto.	do	Mar. 1, 1929, to 1936.	8	1	Do.
Arkansas River at Yancopin.	do	September 1906 to 1936.	30	1	Missouri Pacific R. R. Co., St. Louis, Mo.
North Canadian River at Weleeta.	do	January 1927 to 1936.	10	1	U. S. Engineer Office, Memphis, Tenn.
Red River at Garland City.	do	1890–99, 1932–36	15	1	Vicksburg Engineer District, Vicksburg, Miss.
Ouachita River at Arkadelphia.	do	1905–06, 1929–36	10	1	Do.
Ouachita River at Blanco Springs.	do	1909–10	2	1	Do.
Ouachita River at Champagnolle.	do	1895–99	5	1	Do.
Ouachita River at Cold Springs Bar.	do	1928–36	9	1	Do.
Ouachita River at Fletcher Landing.	do	1911–19	9	1	Do.
Ouachita River at Newport Landing.	do	1916–18	3	1	Do.
Saline River at Warren	do	1925–36	12	1	Do.
Bayou Bartholomew at Wilmot.	do	1925–36	12	1	Do.
Arkansas County	do	1935–36	2	2	Camp BF-2, De Witt, Ark.
Forest Service guard station.	do	1936 (3 months)	1	1	U. S. Forest Service, Hot Springs, Ark.
California					
Los Angeles County	Recording gage	1920–36	16	103	Department of Water and Power, 207 South Broadway, Los Angeles, Calif.
Do	Staff gage	1920–36	16	89	Do.
Do	Recording gage [2]		[1] 2	7	Lloyd Aldrich, City Engineer's Office, Room 608, City Hall, Los Angeles, Calif.
Do	Staff gage [2]		[1] 2	5	Do.
Marin County	do	1936	1	5	Camp SP-23, Mill Valley, Calif.
Santa Barbara	do	1936	1	5	Camp 9, Lompoc, Calif.

[1] Approximate.
[2] Additional information requested.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
California—Continued					
Mendocino County	Staff gage [2]	1935–36	2	2	Camp SP-11, Mendocino, Calif.
	Recording gage [2]	1930–36 [1]	[1] 7	7	F. E. Weymouth, Metropolitan Water District of Southern California, Los Angeles, Calif.
	Staff gage [2]	1930–36 [1]	[1] 7	10	Do.
Mad River at Butler Valley and Ruth; Van Dusen River at Bridgeville and Dinsmore.	do	1929–31	3	4	U. S. Engineer Office, 401 Customhouse, San Francisco, Calif.
Sacramento River at Moulton weir.	Recording gage	1935–36	2	1	U. S. Engineer Office, Room 208, Post Office Bldg., Sacramento, Calif.
Sacramento River at Tisdale weir.	do	1935–36	2	1	Do.
Sacramento River at Colusa weir.	do	1935–36	2	1	Do.
Sacramento River at Fremont weir.	do	1935–36	2	1	Do.
Vicinity of Pasadena	do	1923–36	14	[1] 10	Morris S. Jones, City of Pasadena Water Department, Room 319, City Hall, Pasadena, Calif.
	do.[2]		1	2	Paul F. Henderson, Office of Indian Affairs, 757 South Figueroa St., Los Angeles, Calif.
Los Angeles County	do	1927–36	10	7	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
Do	Staff gage	1927–36	10	30	Do.
	Recording gage		10 to 11	3	Fred G. Hamilton, Southern California Edison Co., P. O. Box 135, Los Angeles, Calif.
	Staff gage [2]		1	13	Do.
Los Angeles River at Niagara St., Los Angeles.	do	1936 [3]	1	1	U. S. Engineer Office, 751 South Figueroa St., Los Angeles, Calif.
Santa Barbara	do	1935–37	2	3	U. S. Forest Service, Star Route, Santa Barbara, Calif.
Do	Recording gage	1935–37	2	3	Do.
Los Angeles	do		3	6	James E. Jones, Department of Water and Power, Los Angeles, Calif.
Do	Staff gage		3	34	Do.
Colorado					
Spring and Dry Creeks, vicinity of Uncompahgre Valley reclamation project.	do	1934–36	3	2	J. B. Tobin, Uncompahgre Valley Water Users Association.
Pueblo Irrigation District No. 2.	Recording gage [4]	1924–36	12	21	F. J. Poch, U. S. Forest Service, Pueblo, Colo.
Florida					
Marion and Putnam Counties and vicinity.	do	1919–36	18	4	U. S. Engineer Office, U. S. Courthouse and Post Office Bldg., Jacksonville, Fla.

[1] Approximate.
[2] Additional information requested.
[3] Discharge measurements only.
[4] Irrigation ditch recordings.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Georgia					
13th St., Augusta Ga	Recording gage	1932-36	5	1	U. S. Engineer Office, Post Office Bldg., Savannah, Ga.
Savannah River at New Savannah Bluff.	do	July 30, 1936, to date.		1	Do.
Savannah River at Stoney Bluff Landing.	Staff gage	1931-36	6	1	Do.
Clyo	do	1931-36	6	1	Do.
Altamaha River at Charlotte.	do	1925-36	12	1	Do.
Georgia Power Co. lakes	do	1933-36	3	7	U. S. Forest Service, Gainesville, Ga.
Idaho					
Henrys Fork and tributaries.	Recording gage	1935-36	2	9	Bureau of Reclamation, Ashton, Idaho.
Do	Staff gage	1935-36	2	8	Do.
American Falls Dam, Minidoka North and South Side Canals.	Recording gage		18	3	Do.
	do.[2]	1910-36	27	4	Office of Indian Affairs, Fort Hall, Idaho.
	Staff gage [2]	1910-36	27	7	Do.
Salmon River at Salmon	do	1928-37	9	1	U. S. Forest Service, Salmon, Idaho.
Middle Fork at Crandall ranch	do	1930-37	7	1	Do.
Boise National Forest	Recording gage	1911-37	26	3	G. B. Maine, Boise National Forest, Boise, Idaho.
Do	Staff gage	1914-37, 1921-37	23, 16	1, 2	Do.
Payette National Forest	Recording gage	1924-37	13	4	W. B. Rice, Payette National Forest, 210 Main St., Boise, Idaho.
Illinois					
Rock Island	do	1934-36	3	2	U. S. Engineer Office, Rock Island, Ill.
Keithsburg	Staff gage	1893-1936	41	1	Do.
Oquawka	do	1929-36	8	1	Do.
Warsaw	do	1930-36	7	1	Do.
Rock Island	Recording gage	1878-1936	59	1	Do.
New Boston	Staff gage	1930-36	7	1	Do.
Quincy	Recording and staff gage.	1878-1936	59	1	Do.
Lake Michigan and Chicago River.	Recording gage	1926-36	11	2	Loran D. Gayton, City of Chicago, Bureau of Engineering, City Hall Chicago, Ill.
Illinois River at Utica, La Salle County.	Staff gage	1930-36	7	1	U. S. Engineer Office, 932 U. S. Post Office Bldg., Chicago, Ill.
Illinois River at Henry, Marshall County.	do	1930-36	7	1	Do.
Illinois River at Pekin, Tazewell County.	do	1930-36	7	1	Do.
Illinois River at Havana, Mason County.	do	1930-36	7	1	Do.
Illinois River at Meredosia, Morgan County.	do	1930-36	7	1	Do.
Sangamon River at Chandlerville, Cass County.	do	1930-36	7	1	Do.
Oxford River in Menard County.	do	1930-36	6	1	Do.
Moline	do	1928-36	9	1	U. S. Engineer Office, Rock Island, Ill.

[2] Additional information requested.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Illinois—Continued					
Rip Rap Landing	Staff gage	1930-36	7	1	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Hamburg	do	1930-36	7	1	Do.
Mouth of Missouri River	do	1925-36	12	1	Do.
East Kaskaskia	do	1891-1936	46	1	Do.
Devils Island	do	1896-1936	41	1	Do.
Beechridge	do	1901-36	36	1	Do.
Carlyle	do	1930-36	7	1	Do.
Indiana					
White River at Hazelton	do	July 15, 1924, to 1936.	2	1	U. S. Engineer Office 1420 Enquirer Bldg., Cincinnati, Ohio.
White River at Petersburg.	Wire-weight gage.	June 18, 1936, to date.	1	1	Do.
White River at Indianapolis.	Recording gage	1927-36	10	1	W. C. Mabee, Indianapolis Water Co., 113 Monument Circle, Indianapolis, Ind.
White River at Broad Ripple.	do	1927-36	10	1	Do.
Fall Creek near Oaklandon.	Staff gage	1935-36	2	1	Do.
Tradewater River at Dalton.	Chain gage	June 9, 1928, to 1936.	9	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Iowa					
Guttenberg	Staff gage	1932-36	5	1	U. S. Engineer Office, Rock Island, Ill.
Waupeton	do	1930-36	7	1	
Bellevue	do	1933-36	4	1	Do.
Lyons	do	1930-36	7	1	Do.
Clinton	do	1893-1936	44	1	Do.
Princeton	do	1931-36	6	1	Do.
Montpelier	do	1930-36	7	1	Do.
Fairport	do	1912-36	25	1	Do.
Mississippi River at Specht's Ferry.	do	1930-36	7	1	Do.
Mississippi River at Dubuque.	Recording gage	1935	2	1	Do.
Mississippi River at Gordons Ferry.	Staff gage	1930-36	7	1	Do.
Mississippi River at Sabula.	do	1893-1936	44	1	Do.
Mississippi River at Muscatine.	do	1878-1936	59	1	Do.
Mississippi River at Burlington.	do	1878-1936	59	1	Do.
Kossuth County	do	1936	1	1	Camp D-3, Bancroft, Iowa.
Kentucky					
Kentucky River at locks and dams Nos. 1-3.	do	Jan. 1, 1894, to 1936.	43	3	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Kentucky River at lock and dam No. 4.	do	Jan. 1, 1894, to Mar. 31, 1901.	7	1	Do.
Kentucky River at locks and dams Nos. 5-6.	do	Jan. 1, 1894, to 1936.	43	2	Do.
Kentucky River at lock and dam No. 7.	do	Nov. 28, 1897, to Apr. 19, 1901.	4	1	Do.
Kentucky River at lock and dam No. 8.	do	Aug. 24, 1898, to 1936.	38	1	Do.
Kentucky River at lock and dam No. 9.	do	June 10, 1901, to 1936.	36	1	Do.
Kentucky River at lock and dam No. 10.	do	July 1, 1903, to Dec. 31, 1932.	29	1	Do.
Kentucky River at lock and dam No. 11.	do	June 1, 1904, to 1936.	33	1	Do.
Kentucky River at lock and dam No. 12.	do	Apr. 1, 1907, to 1936.	30	1	Do.
Kentucky River at lock and dam No. 13.	do	June 9, 1909, to 1936.	28	1	Do.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Kentucky—Continued					
Kentucky River at lock and dam No. 14.	Staff gage	Apr. 20, 1910, to Dec. 31, 1932.	23	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Green River at lock and dam No. 1.	do	Jan. 1, 1900, to 1936.	37	1	Do.
Green River at lock and dam No. 2.	do	Mar. 1, 1899, to July 1, 1909.	10	1	Do.
Green River at Livermore.	do	Mar. 22, 1930, to 1936.	6	1	Do.
Green River at lock and dam No. 3.	do	July 1, 1899, to 1936.	37	1	Do.
Green River at Morgantown.	do	July 13, 1931, to 1936.	5	1	Do.
Green River at lock and dam No. 4.	do	Mar. 1, 1899, to Jan. 15, 1917.	17	1	Do.
Green River at lock and dam No. 5.	do	Jan. 1, 1900, to 1936.	37	1	Do.
Green River at lock and dam No. 6.	do	Jan. 1, 1906, to Jan. 15, 1917.	11	1	Do.
Green River at Mammoth Cave.	do	June 6, 1936, to date.	1	1	Do.
Green River at Munfordville.	do	July 7, 1921, to Dec. 31, 1925.	1	1	Do.
Pond River at White Plains.	do	June 6, 1928, to 1936.	9	1	Do.
Rough River at lock and dam No. 1.	do	July 1, 1899, to 1936.	37	1	Do.
Rough River at Dundee	Chain gage	Apr. 1, 1930, to 1936.	7	1	Do.
Rough River	do	Nov. 10, 1935, to 1936.	1	1	Do.
Barren River at lock and dam No. 1.	Staff gage	Jan. 1, 1900, to 1936.	37	1	Do.
Nolin River at Wax	do	Dec. 7, 1935, to 1936.	1	1	Do.
Louisiana					
Tensas River and Old River Lakes Basin.	do	1932, 1935–36	3	30	U. S. Engineer Office, 2d District, New Orleans, La.
Red River at Grand Ecore.	do	1913–36	24	1	U. S. Engineer Office, Vicksburg, Miss.
Bayou Dorcheat at Minden.	do	1928–31, 1936	5	1	Do.
Black River at Black River Station.	do	1892–1905	14	1	Do.
Ouachita River at Riverton.	do	1896–1913	18	1	Do.
Bayou Bartholomew at Beckman.	do	1928–36	9	1	Do.
Tensas River at Clayton	do	1916–36	21	1	Do.
Bayou Macon at Delhi	do	1925–36	12	1	Do.
Bayou D'Arbonne at Farmerville.	do	1925–36	12	1	Do.
Black River at Acme	do	1925–36	12	1	Do.
Boeuf River at Girard	do	1925–36	12	1	Do.
Cypress Bayou at Mooringsport.	do	1932–36	5	1	Do.
Tensas River at Tendal	do	1935–36	2	1	Do.
Maine					
Penobscot River near Old Town.	Recording gage	1913–36	24	4	Thomas W. Clark, hydraulic engineer, Old Town, Maine.
Michigan					
Red Cedar River in Ingham County.	do	1931–36	6	1	C. L. Allen, Michigan State College, East Lansing, Mich.
Do	Staff gage	1926–36	11	1	Do.
Minnesota					
Grand Rapids	Recording gage	1930–36 [1]	[1] 7	1	U. S. Engineer Office, 615 Commerce Bldg., St. Paul, Minn.
South St. Paul	do	1935–36 [1]	[1] 2	1	Do.
Hastings	do	1931–36 [1]	[1] 6	1	Do.
Wabasha	do	1935–36 [1]	[1] 2	1	Do.

[1] Approximate.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Mississippi					
Pearl River near Picayune, Miss., and Bush, La.	Staff gage [5]	1935–36	2	4	R. Park, U. S. Engineer Office, Mobile, Ala.
Yazoo River at Redwood	do	1911–36	26	1	U. S. Engineer Office, Vicksburg, Miss.
Yazoo River at Satartia	do	1929–36	8	1	Do.
Coldwater River at Coldwater.	do	1928–36	9	1	Do.
Little Tallahatchie River at Sardis.	do	1928–36	9	1	Do.
Sunflower River at Baird	do	1913–25	13	1	Do.
Sunflower River at Holly Bluff.	do	1910–36	27	1	Do.
Sunflower River at lock and dam No. 1.	do	1912–36	25	1	Do.
Sunflower River at Sunflower.	do	1918–36	19	1	Do.
Yalobusha River at Grenada.	do	1928–36	9	1	Do.
Yocona River at Enid	do	1928–36	9	1	Do.
Yazoo River at Fort Loring.	do	1932–36	5	1	Do.
Big Black River at Ragin	do	1929–36	8	1	Do.
Big Black River at Bovina.	do	1936	1	1	Do.
Big Black River at Hankinson.	do	1936	1	1	Do.
Big Black River at Pickens.	do	1936	1	1	Do.
Big Black River at West	do	1936	1	1	Do.
Big Black River at Kilmichael.	do	1936	1	1	Do.
Coldwater River at Savage.	do	1935–36	2	1	Do.
Tallahatchie River at Lambert.	do	1936	1	1	Do.
Missouri					
Hine	do	1930–35	6	1	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Halls Ferry	do	1930–35	6	1	Do.
Bellefontaine	do	1930–35	6	1	Do.
St. Francis River at Chaonia.	do	Nov. 1, 1916, June 30, 1933, and Sept. 6, 1934, to 1936.	21	1	U. S. Engineer Office, Memphis, Tenn.
St. Francis River at Wappapello.	do	Apr. 29, 1920, to 1936.	17	1	Do.
Little River at Hornersville.	do	Jan. 1, 1933, to 1936.	4	1	Do.
Black River at Mengo Bridge.	do	July 28, 1918, to 1936.	18	1	Do.
Black River at Gillis Bluff.	do	July 26, 1918, to 1936.	18	1	Do.
St. Nicholas Rock	do	1905–36	32	1	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Brickeys	do	1891–1936	46	1	Do.
Little Rock	do	1891–1936	46	1	Do.
Bishop	do	1933–36	4	1	Do.
Red Rock	do	1896–1936	41	1	Do.
Cumberland	do	1933–36	4	1	Do.
Crawford	do	1933–36	4	1	Do.
Moccasin Springs	do	1896–1936	41	1	Do.
Birds Point	do	1932–36	5	1	Do.
Bernheimer	do	1930–35	6	1	Do.
New Haven	do	1930–35	6	1	Do.
Washington	do	1929–35	7	1	Do.
Matson	do	1930–35	6	1	Do.
Weldon Springs	do	1930–35	6	1	Do.

[5] Observations are taken at 7 a. m. each day and are accurate within 0.1 foot.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Missouri—Continued					
Maquoketa	Staff gage	1930–36	7	1	U. S. Engineer Office, Rock Island, Ill.
Louisiana	Recording gage	1878–1936	59	1	Do.
Clarksville	Staff gage	1930–36	7	1	Do.
Canton	Recording gage	1930–36	7	1	Do.
Hannibal	Recording and staff gage.	1878–1936	59	1	Do.
Sterling Landing	Staff gage	1930–36	7	1	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Cap au Gris	do	1930–36	7	1	Do.
Portage des Sioux	do	1933–36	4	1	Do.
Chain of Rocks, St. Louis	do	1892–1936	45	1	Do.
Bissell Point, St. Louis	do	1880–1936	57	1	Do.
Engineer depot, St. Louis	do	1894–1936	43	1	Do.
Jefferson Barracks	do	1891–1936	46	1	Do.
Waters Point	do	1891–1936	46	1	Do.
New Jersey					
Drainage basin of Raymond Dam, Wanaque.	Recording gage	1929–36 [1]	8	3	Crystal Brown, North Jersey District, Water Supply Commission, Wanaque, N. J.
Do	do	1935–36	2	1	Do.
Do	Staff gage	1921–30	10	1	Do.
Hackensack River	Recording gage	1921–36	16	1	Hackensack Water Co., Weehawken, N. J.
Pascack Creek	do	1934–36	3	1	Do.
Nevada					
Storey and Lyon Counties.	do		10 to 29	4	W. H. Wallace, Truckee-Carson Irrigation District, Fallon, Nev.
Humboldt River above and below Rye Patch reservoir.	do	1936	1	2	L. J. Foster, Bureau of Reclamation, Humboldt Project, Lovelock, Nev.
North Carolina					
Copper Basin, Coweta, Bent Creek.	do	1934–36	3	34	U. S. Forest Service, Asheville, N. C.
Ohio					
Ohio River at lock and dam No. 4.	Staff gage	Feb. 1, 1908, to 1936.	29	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Ohio River at lock and dam No. 5.	do	May 9, 1899, to 1936.	38	1	Do.
Ohio River at Montgomery locks and dam.	do	October 1934 to 1936.	2	1	Do.
Ohio River at lock and dam No. 7.	do	Sept. 13, 1911, to 1936.	25	1	Do.
Ohio River at lock and dam No. 8.	do	May 1, 1911, to 1936.	26	1	Do.
Ohio River at lock and dam No. 9.	do	Jan. 1, 1913, to 1936.	24	1	Do.
Ohio River at lock and dam No. 10.	do	Jan. 1, 1913, to 1936.	24	1	Do.
Ohio River at lock and dam No. 11.	do	Aug. 1, 1911, to 1936.	25	1	Do.
Ohio River at lock and dam No. 14.	do	July 27, 1911, to 1936.	25	1	Do.
Ohio River at lock and dam No. 15.	do	July 20, 1911, to 1936.	25	1	Do.
Ohio River at lock and dam No. 16.	do	Sept. 4, 1913, to 1936.	23	1	Do.
Ohio River at lock and dam No. 17.	do	Oct. 1, 1913, to 1936.	23	1	Do.
Ohio River at lock and dam No. 18.	do	Feb. 2, 1903, to 1936.	34	1	Do.

[1] Approximate.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Ohio—Continued					
Ohio River at lock and dam No. 19.	Staff gage	July 27, 1908, to Oct. 31, 1916.	8	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Ohio River at lock and dam No. 20.	do	June 5, 1911, to May 31, 1917.	6	1	Do.
Ohio River at lock and dam No. 21.	do	May 15, 1915, to 1936.	22	1	Do.
Ohio River at lock and dam No. 22.	do	May 1, 1915, to June 20, 1915.	1	1	Do.
Ohio River at lock and dam No. 23.	do	May 1, 1917, to 1936.	20	1	Do.
Ohio River at lock and dam No. 24.	do	Nov. 1, 1913, to 1936.	24	1	Do.
Ohio River at lock and dam No. 25.	do	May 1, 1917, to Dec. 31, 1928.	12	1	Do.
Ohio River at lock and dam No. 26.	do	July 2, 1908, to Dec. 31, 1915.	8	1	Do.
Ohio River at lock and dam No. 27.	do	Nov. 19, 1917, to 1936.	20	1	Do.
Ohio River at lock and dam No. 28.	do	July 8, 1911, to Oct. 31, 1913.	2	1	Do.
Ohio River at lock and dam No. 31.	do	Nov. 1, 1920, to 1936.	16	1	Do.
Ohio River at lock and dam No. 34.	do	Oct. 1, 1919, to 1936.	17	1	Do.
Ohio River at lock and dam No. 41.	do	Jan. 1, 1875, to 1936.	62	1	Do.
Ohio River at lock and dam No. 43.	do	June 8, 1914, to Oct. 31, 1922.	9	1	Do.
Ohio River at lock and dam No. 44.	do	Dec. 1, 1919, to Sept. 30, 1925.	6	1	Do.
Ohio River at lock and dam No. 45.	do	July 14, 1920, to Dec. 31, 1927.	7	1	Do.
Ohio River at lock and dam No. 46.	do	Sept. 1, 1923, to Dec. 31, 1927.	4	1	Do.
Ohio River at lock and dam No. 47.	do	May 21, 1923, to Dec. 31, 1927.	5	1	Do.
Ohio River at lock and dam No. 48.	do	Dec. 31, 1921, to July 21, 1923.	2	1	Do.
Ohio River at lock and dam No. 49.	do	June 1, 1924, to Dec. 31, 1927.	4	1	Do.
Muskingum River at lock and dam No. 3.	do	April 1887 to Dec. 31, 1929.	43	1	Do.
Muskingum River at lock and dam No. 4.	do	April 1887 to Feb. 2, 1905.	19	1	Do.
Muskingum River at locks and dams Nos. 5, 6, 8, 9, and 11.	do	April 1887 to 1936.	50	1	Do.
Muskingum River at lock and dam No. 7.	do	April 1887 to May 24, 1913.	27	1	Do.
Muskingum River at lock and dam No. 10.	do	April 1887 to Dec. 31, 1897.	11	1	Do.
Muskingum River at lock and dam No. 11.	do	April 1887 to 1936.	50	1	Do.
Ohio River at lock and dam No. 1.	do	October 1885 to 1922.	37	1	Do.
Ohio River at Emsworth locks and dam.	do	Sept. 9, 1921, to 1936.	15	1	Do.
Ohio River at lock and dam No. 2.	do	November 1906 to 1936.	30	1	Do.
Ohio River at lock and dam No. 3.	do	Jan. 1, 1908, to Oct. 31, 1929.	22	1	Do.
Ohio River at Dashields locks and dam.	do	Nov. 1, 1929, to 1936.	7	1	Do.
Ohio River at Emsworth locks and dam.	Recording gage	February 1927 to March 1936.	8	1	Do.
Muskingum Basin, Indian Fork at Atwood Dam.	Staff gage	August 1935 to 1936.	1	1	Do.
Muskingum Basin, Sugar Creek at Beach City Dam.	do	April 1935 to 1936.	2	1	Do.
Muskingum Basin, Sandy Creek at Bolivar Dam.	do	October 1935 to 1936.	1	1	Do.
Muskingum Basin, Black Fork at Charles Mill Dam.	do	January 1935 to 1936.	2	1	Do.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Ohio—Continued					
Muskingum Basin, Brushy Fork at Clendening Dam.	Staff gage	March 1935 to 1936.	2	1	U. S. Engineer Office. 1420 Enquirer Bldg., Cincinnati, Ohio.
Muskingum Basin, Tuscarawas River at Dover Dam.	do	June 1935 to 1936.	2	1	Do.
Muskingum Basin, McGuire Creek at Leesville Dam.	do	do	2	1	Do.
Muskingum Basin, Walhonding River at Mohawk Dam.	do	May 1935 to 1936.	2	1	Do.
Muskingum Basin, Lake Fork at Mohicanville Dam.	do	June 1935 to 1936.	2	1	Do.
Muskingum Basin, Stillwater Creek at Piedmont Dam.	do	do	2	1	Do.
Muskingum Basin, Clear Fork, at Pleasant Hill Dam.	do	September 1935 to 1936.	1	1	Do.
Muskingum Basin, Seneca Fork at Senecaville Dam.	do	May 1935 to 1936.	2	1	Do.
Muskingum Basin, Little Stillwater Creek at Tappan Dam.	do	January 1935 to 1936.	2	1	Do.
Muskingum Basin, Wills Creek at Wills Creek Dam.	do	February 1935 to 1936.	2	1	Do.
Muskingum Basin, Muskingum River at lock and dam No. 1.	do	April 1887 to June 30, 1914.	28	1	Do.
Muskingum Basin, Muskingum River at lock and dam No. 2.	do	April 1887 to 1936.	50	1	Do.
Ohio River at lock and dam No. 50.	do	June 18, 1924 to Dec. 31, 1928.	5	1	Do.
Ohio River at lock and dam No. 51.	do	Feb. 26, 1925, to Dec. 31, 1928.	4	1	Do.
Ohio River at lock and dam No. 52.	do	Aug. 1, 1924, to Dec. 31, 1928.	4	1	Do.
Ohio River at lock and dam No. 53.	do	Aug. 8, 1924, to Dec. 31, 1928.	4	1	Do.
Miami Conservancy District.	do		10 to 20	3	The Miami Conservancy District, Dayton, Ohio.
Oregon					
Wallowa National Forest.	Recording gage	1925–37	12	5	Roland Huff, Wallowa National Forest, Enterprise, Oreg.
Do	Staff gage	1914–37	23	1	Do.
Pennsylvania					
Allegheny River at lock and dam No. 2.	Recording gage	February 1927 to 1936.	11	1	U. S. Engineer office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Allegheny River at lock and dam No. 3.	do	December 1926 to August 1932.	7	1	Do.
Allegheny River at Big Bend.	do	September 1935 to 1936.	1	1	Do.
Monongahela River at lock and dam No. 2.	do	May 1927 to 1936.	11	1	Do.
Monongahela River at lock and dam No. 5.	do	March 1927 to 1936.	11	1	Do.
Allegheny River at lock and dam No. 1.	Staff gage	January 1903 to 1936.	34	1	Do.
Allegheny River at lock and dam No. 2.	do	Sept. 19, 1905, to 1936.	31	1	Do.
Allegheny River at lock and dam No. 3.	do	January 1905 to Dec. 31, 1924.	20	1	Do.
Allegheny River at lock and dam No. 4.	do	Mar. 1 to Aug. 31, 1927.	1	1	Do.
Allegheny River at lock and dam No. 6.	do	Jan. 1, 1929, to 1936.	8	1	Do.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Pennsylvania—Contd.					
Allegheny River at lock and dam No. 7.	Staff gage	Nov. 1, 1930, to 1936.	6	1	U. S. Engineer office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Allegheny River at lock and dam No. 8.	do	July 1, 1931, to 1936.	5	1	Do.
Allegheny River at lock and dam No. 9.	do	Oct. 1, 1935, to 1936.	1	1	Do.
Monongahela River at lock and dam No. 1.	do	July 1, 1897, to 1936.	39	1	Do.
Monongahela River at lock and dam No. 2.	do	August 1897 to 1936.	39	1	Do.
Monongahela River at lock and dam No. 3.	do	July 10, 1897, to 1936.	39	1	Do.
Monongahela River at lock and dam No. 5.	do	Aug. 11, 1897, to 1936.	39	1	Do.
Monongahela River at lock and dam No. 6.	do	July 1, 1897, to 1936.	39	1	Do.
Monongahela River at lock and dam No. 7.	do	Oct. 1, 1897, to Jan. 1, 1921.	24	1	Do.
Monongahela River at lock and dam No. 8.	do	July 1, 1897, to 1936.	39	1	Do.
Monongahela River at lock and dam No. 9.	do	July 1897 to February 1927.	30	1	Do.
Monongahela River at lock and dam No. 10.	do	May 1, 1904, to Jan. 1, 1931.	27	1	Do.
Monongahela River at locks and dams Nos. 11-13.	do	May 1, 1904, to 1936.	33	3	Do.
Monongahela River at lock and dam No. 14.	do	Apr. 10, 1904, to 1936.	33	1	Do.
Monongahela River at lock and dam No. 15.	do	May 1, 1904, to Jan. 1, 1921.	18	1	Do.
Tennessee					
Wolf River at Raleigh	do	May 11, 1936, to date.	1	1	U. S. Engineer Officer Memphis, Tenn.
Texas					
Vicinity of Temple	Recording gage	May 1934 to 1936.	3	4	Soil Conservation Service, Washington, D. C.
Utah					
Weber County	do	1935-36	2	7	Bureau of Reclamation, Ogden, Utah.
Do	Staff gage	1935-36	2	6	Do.
Lake Fork River	Recording gage	1934-36	3	5	U. S. Indian Irrigation Service, Myton, Utah.
Wasatch Branch Station, David County.	do	1934-36 or 1936	2 or 1	[6] 31	A. R. Croft, Intermountain Forest and Range Experiment Station, Bountiful, Utah.
Do	Staff gage	1936 (6 months)	1	1	Do.
Bear River and Canals, Bear Lake County.	Recording gage	1913-36	24	3	Utah Power & Light Co., Salt Lake City, Utah.
Washington					
Yakima project	Recording gage	1896-1936	41	18	Bureau of Reclamation, Yakima, Wash.
Do	Staff gage	1905-36	32	60	Do.
Bellingham	Recording gage	1928-37	9	2	Thomas H. Burgess, U. S. Forest Service, Bellingham, Wash.
West Virginia					
Tygart River above and below Tygart Dam.	do	April 1935 to 1936.	2	2	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Tygart River at Arden	do	March 1936 to date.	1	1	Do.
New River at Hinton	do	June 15, 1936, to date.	1	1	Do.
Greenbrier River at Hilldale.	do	do	1	1	Do.
Tygart River at Tygart Dam.	Staff gage	October 1934 to 1936.	2	1	Do.

[6] 15 stations with 6-month records.

Stream-gaging stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
West Virginia—Contd.					
Little Kanawha River at lock and dam No. 1.	Staff Gage	Nov. 1, 1905, to 1936.[7]	31	1	U. S. Engineer Office, 1420 Enquirer Bldg., Cincinnati, Ohio.
Little Kanawha River at lock and dam No. 2.	do	do.[8]	31	1	Do.
Little Kanawha River at lock and dam No. 3.	do	do.[9]	31	1	Do.
Little Kanawha River at lock and dam No. 4.	do	1906–7, 1909–11, 1914–16, 1919, 1925–27, 1929–30.	14	1	Do.
Little Kanawha River at lock and dam No. 5.	do	July 1, 1896, to 1936.	40	1	Do.
Kanawha River at lock and dam No. 2.	do	1887–1934	48	1	Do.
Kanawha River at London locks and dam.	do	June 30, 1934, to 1936.	3	1	Do.
Kanawha River at lock and dam No. 3.	do	1878–1934	57	1	Do.
Kanawha River at lock and dam No. 4.	do	1873–1934	62	1	Do.
Kanawha River at Marmet locks and dam.	do	May 12, 1934, to 1936.	3	1	Do.
Kanawha River at lock and dam No. 5.	do	1885–1934	50	1	Do.
Kanawha River at lock and dam No. 6.	do	October 1880 to Dec. 31, 1933.	53	1	Do.
Kanawha River at lock and dam No. 7.	do	May 1889 to 1936	48	1	Do.
Kanawha River at lock and dam No. 8.	do	February 1893 to 1936.	44	1	Do.
Kanawha River at lock and dam No. 9.	do	July 1893 to 1936	43	1	Do.
Kanawha River at lock and dam No. 10.	do	August 1899 to 1936.	37	1	Do.
Kanawha River at lock and dam No. 11.	do	December 1894 to 1936.	43	1	Do.
Big Sandy River at locks and dams Nos. 1, 2.	do	1932–36[10]	5	2	Do.
Tug Fork of Big Sandy River at lock and dam No. 1.	do	1932–36[11]	5	1	Do.
Levisa Fork of Big Sandy River at lock and dam No. 1.	do	1932–36[11]	5	1	Do.
Wisconsin					
Cassville	do	1930–36	7	1	U. S. Engineer Office, Rock Island, Ill.
Alma	Recording gage	1935–36[1]	[1] 2	1	U. S. Engineer Office, 615 Commerce Bldg., St. Paul, Minn.
Upper Mississippi Erosion Experiment Station.	do	1933–36	4	1	Lake States Forest Experiment Station, Box 643, La Crosse, Wis.
Wyoming					
Snake River at Moran	do		18	1	U. S. Bureau of Reclamation, Burley, Idaho.

[1] Approximate.
[7] No record for October and November 1907.
[8] No record for Feb. 22 to Mar. 23, 1907.
[9] No record for Sept. 8 to Oct. 21, 1908.
[10] Records practically complete since 1905.
[11] Records practically complete since 1910.

MISCELLANEOUS STATIONS

The following list includes miscellaneous stations of various types.

Miscellaneous stations

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Alabama					
Montgomery	Sling psychrometer	1933–36 [1]	3	1	U. S. Forest Service, Montgomery, Ala.
Do	Fan psychrometer	1936	1	2	Do.
Arizona					
United States field station, Sacaton.	Sunshine recorder and soil thermograph.	1933–36	3	1	C. J. King, United States Field Station, Sacaton, Ariz.
Do	Maximum and minimum temperature.	1910–36	26	1	Do.
Grand Canyon National Park.	Temperature	1933–36	4	1	Superintendent, Grand Canyon National Park.
Do	do	1934–36 [2]	3	1	Do.
Santa Rita experiment range.	Maximum and minimum temperature.	1923–37	14	1	University of Arizona, 304 Agriculture Bldg., Tucson, Ariz.
Do	Transpiration	1934–37	3	1	Do.
Do	Soil and air thermograph.	1933–37	4	3	Do.
Do	Sunlight-intensity recorder.	1933–37	4	1	Do.
Do	Sunlight-duration recorder.	1933–37	4	1	Do.
Globe	Transpiration	1934–36	2	2	Parker Creek Forest Influences Experimental Area, Box 443, Globe, Ariz.
Prescott	Maximum and minimum temperature.	1919–36	17	1	U. S. Forest Service, Prescott, Ariz.
Arkansas					
Rice Branch Experiment Station, Fayetteville.	Maximum and minimum nonrecording thermometer.	1929–36	7	1	G. H. Banks, University of Arkansas, Fayetteville, Ark.
Do	Sling psychrometer	1929–36	7	1	Do.
Do	Evaporation pan with hook gage.	1929–36	7	1	Do.
Do	Anemometer	1929–36	7	1	Do.
Do	Recording soil and air thermometer.	1931–36	7	1	Do.
Near Rice Branch Experiment Station, Fayetteville.	Evaporation pan with hook gage.	1935–36	1	1	Do.
Forest Service guard station.	Hydrothermograph	1930–36 1936	7 1	2	U. S. Forest Service, Hot Springs, Ark.
California					
Vicinity of Long Beach.	Recording thermometer and humidity recorder.		[3] 2	1	Fred S. Porter, Long Beach Water Department, 308 Municipal Utilities Bldg., Long Beach, Calif.
Los Angeles County	Transpiration	1932–36	4	1	C. H. Howell, Los Angeles County Flood Control District, 205 South Broadway, Los Angeles, Calif.
California Forest and Range Experiment Station.	Maximum and minimum thermometer.	1931–36, [4] 1932–36, 1934–36	5 4 2	5	Forest Supervisor, Stanislaus National Forest, Sonora, Calif.
Susanville Forest Nursery.	Hydrothermograph	1930–36	6	1R	U. S. Forest Service, Susanville, Calif.
Yreka, Klamath National Forest.	do	1917–36	20	1	U. S. Forest Service, Yreka, Calif.

[1] Readings during fire season.
[2] Summer only.
[3] Approximate.
[4] 1 (1934) station year long; 4 seasonal, Apr. 1 to Nov. 15.

R = Recordings.

Miscellaneous stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
California—Contd.					
Burgess Springs experiment range, Lassen County.	Hydrothermograph	1936 [5]	1	1	E. I. Kotok, California Forest and Range Experiment Station, Berkeley, Calif.
Do	Psychrometer	1936 [5]	1	1	Do.
Do	Anemometer	1936 [5]	1	1	Do.
Do	Atmometer and maximum and minimum soil temperature.	1936 [5]	1	1	Do.
Blacks Mountain experiment forest, Lassen County.	Hydrothermograph	1936 [5]	1	1	Do.
Do	Psychrometer	1936 [5]	1	1	Do.
Do	Anemometer	1936 [5]	1	1	Do.
Do	Atmometer	1936 [5]	1	1	Do.
Do	Maximum and minimum soil temperature.	1936 [5]	1	1	Do.
Institute of Forest Genetics.	Maximum and minimum temperatures; thermograph.	1927–36	10	3	Do.
Do	Psychrometer	1927–36	10	3	Do.
Hackamore, Modoc County.	Recording thermometer.	1931–36	5	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Fort Collins, Bessey division.	Maximum and minimum thermometer.	1919–36	17	1	Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.
Do	Soil thermometer	1919–36	17	3	Do.
Do	Psychrometer	1919–36	17	2	Do.
Florida					
Lake Okeechobee	Transpiration	1934–36	2	1	U. S. Engineer Office, U. S. Courthouse and Post Office Bldg., Jacksonville, Fla.
Georgia					
Range headquarters	Sling and fan psychrometers.	1934–36	2	3	U. S. Forest Service, Gainesville, Ga.
Idaho					
Coeur d'Alene	Hygrothermograph	1933–36	3	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Lemhi (Challis) National Forest.	Maximum and minimum thermometer.	1915–36	22	1	E. E. McKee, supervisor, Lemhi (Challis) National Forest, Mackay, Idaho.
Challis National Forest.	Psychrometer	1916–36	20	1	E. E. McKee, supervisor, Challis National Forest, Challis, Idaho.
Intermountain Forest and Range Experiment Station.	Transpiration	1935–36 [7]	2	1	G. D. Pickford, U. S. Sheep Station Branch, Dubois, Idaho.
Idaho City, Idaho, and Shafer Butte, Snake Creek, and Iron Mountain, Mont., and vicinity.	Psychrometer	1932–36 [8]	5	5	U. S. Weather Bureau, Missoula, Mont.
Idaho City, Shafer Butte, Iron Mountain, and Garden Valley.	Maximum and minimum thermometer.	1932–36	5	[8] 4	Do.
Idaho City, Idaho, and Snake Creek and Shafer Butte, Mont.	Hydrothermograph	1932–36 [6]	5	3	Do.
Illinois					
Near Kampsville	Transpiration and evaporation.	1933–35	2	1	U. S. Engineer Office, 816 U. S. Courthouse and Customhouse, St. Louis, Mo.
Shawnee purchase unit.	Fan psychrometer and Duff hydrometer.	1936	1	1	U. S. Forest Service, Rosiclare, Ill.

[5] June to October, inclusive.
[6] June 20 to Sept. 30.
[7] 6 months season.
[8] 2 stations June 20 to Sept. 30.

Miscellaneous stations—Continued

Location	Type of station	Years of record		Number of stations	Official or agency
		Period covered	Length in years		
Kansas					
Newman	Maximum and minimum temperature.	1934–36	2	1	A. L. Clapp, Kansas State College, Manhattan, Kans.
Blair	do	1934–36	2	1	Do.
Garden City	do	1908–36	28	1	L. E. Call, Manhattan, Kans.
Do	Anemometer	1908–36	28	1	Do.
Do	Psychrometer	1908–36	28	1	Do.
Tribune	Maximum and minimum temperature.	1913–36	23	1	Do.
Do	Anemometer	1921–32	15	1	Do.
Louisiana					
Stuart Nursery	Atmometers	1935–36 [2]	1	1	Stuart Nursery, Pollock, La.
Do	Psychrometer	1935–36 [2]	1	1	Do.
Alexandria	Sling and fan psychrometer.	1935–36	1	1	U. S. Forest Service, Alexandria, La.
Michigan					
Huron National Forest	Maximum and minimum thermometers.	1935–36	1	3	U. S. Forest Service, East Tawas, Mich.
Do	Whirling psychrometer.	1935–36 [9]	1	2	Do.
Watersmeet Nursery and Forest Towers.	Psychrometer	1936	1	7	U. S. Forest Service, Ironwood, Mich.
Mason County, Manistee purchase unit.	Fan psychrometer	1935–36 [10]	1	1	U. S. Forest Service, Muskegon, Mich.
Do	Duff hydrometer	1935–36	1	1	Do.
Raco Range Station and Marquette County.	Psychrometer	1933–36, 1926–36	3 10	2	U. S. Forest Service, Escanaba, Mich.
Marquette County	Hydrograph	1926–36	10	1	Do.
Do	Soil thermometer	1926–36	10	1	Do.
Mississippi					
Harrison Experiment Forest.	Transpiration (small lysiphytometers).	1935–37	2	1	Harrison Experiment Forest, Saucier, Miss.
Do	Hydrothermograph	1934–37	3	1	Do.
Do	Atmometers	1934–37	3	1	Do.
Holly Springs branch	Soil-air thermograph	1932 37 [11]	5	1	Southern Forest Experiment Station, Box 71, Holly Springs, Miss.
Bogalusa branch	Hydrothermograph	1932–34 [2]	2	1	Do.
Missouri					
Licking and Willow Springs.	Duff hydrometer and sling and fan psychrometer.	1936	1	2	Gardner Purchase Unit, U. S. Forest Service, 218½ West Willow St., Springfield, Mo.
Montana					
Libby	Maximum and minimum thermometer.	1917–36	20	1	Forest Supervisor, Kootenai National Forest, Libby, Mont.
Do	Sling psychrometer	1917–36	20	1	Do.
Deerlodge National Forest.	Maximum and minimum thermometer.	1936 [12]	1	2	Forest Supervisor, U. S. Department of Agriculture, Butte, Mont.
Do	Duff hygrometer	1936 [12]	1	2	Do.
Do	Psychrometer	1936 [12]	1	2	Do.
Butte	do	1936 [13]	1	1	Do.
Absaroka National Forest.	Sling psychrometer	1936 [14]	1	1	G. E. Martin, Absaroka National Forest, Livingston, Mont.
Chouteau	Maximum and minimum thermometer.	1920–37	17	2	U. S. Forest Service, Chouteau, Mont.
Daisy Peak	Hygrometer	1936	1	1	David Lake, Forest Ranger, Harlowton, Mont.
Shafer Butte, Snake Creek, and Iron Mountain and vicinity.	Psychrometer	1932–36 [6]	5	5	U. S. Weather Bureau, Missoula, Mont.

[2] Summer only.
[6] June 20, Sept. 30.
[9] 6 summer months.
[10] May to November 1935 and June to October 1936.
[11] Winter months only.
[12] June 1 to Sept. 30.
[13] May 1 to Oct. 31.
[14] July 20 to Sept. 30.

Miscellaneous stations—Continued

Location	Type of station	Years of record		Number of stations	Office or agency
		Period covered	Length in years		
Montana—Continued					
Shafer Butte, Iron Mountain, and Garden Valley.	Maximum and minimum thermometer.	1932–36	5	[8] 4	U. S. Weather Bureau, Missoula, Mont.
Snake Creek and Shafer Butte.	Hydrothermograph	1932–36 [6]	5	3	Do.
New Jersey					
Morristown	Recording hygrometer and thermometer.	1935–36	1	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Near New Lisbon	Maximum and minimum thermometer, soil and air.	1934–36	2	1	U. S. Forest Service Experiment Station, 3437 Woodland Ave., Philadelphia, Pa.
New Mexico					
Jornada Experiment Range.	Psychrometer	1929 37	8	1	Jornada Experiment Range, Box 671, Las Cruces, N. Mex.
Do	Maximum and minimum temperature.	1914–36	22	1	Do.
North Dakota					
Souris Basin	do	1931–36	5	1	Lake States Forest Experiment Station, Denbigh, N. Dak.
Oregon					
Whitman National Forest.	Hygrothermograph (Weather Bureau).	1914–37 [15]	13	2	R. E. Foote, Whitman National Forest, Baker, Oreg.
Ochoco National Forest	Psychrometer	1932–37 [1]	5	7	Ochoco National Forest, Prineville, Oreg.
Do	Hygrothermograph	1932–37 [1]	5	2	Do.
Pennsylvania					
Kane	Maximum and minimum thermometer.	1932–36	4	1	U. S. Forest Service Experiment Station, 3437 Woodland Ave., Philadelphia, Pa.
Do	Hygrothermograph	1932–36	4	1	Do.
South Carolina					
Columbia	Sling and fan psychrometer.	1935–36	1	1	U. S. Forest Service, Columbia, S. C.
Utah					
Desert Range Branch Station.	Anemometer	1931–36 1934–36	5 2	3	Selar S. Hutchings, Intermountain Forest and Range Experiment Station, Milford, Utah.
Do	Thermographs with maximum and minimum temperatures.	1931–36 1933–36	5 3	3	Do.
Do	Soil thermograph and thermometers.	1935–36	1	1	Do.
Do	Hydrograph and sling psychrometer.	1935–36	1	1	Do.
Do	Soil-mosture readings	1936	1	1	Do.
Washington					
Sullivan Lake, Kamksu National Forest.	Hygrothermograph	1931–33 [2]	2	1	Bureau of Entomology and Plant Quarantine, Washington, D. C.
Newman Lake	Anemometer, recording hygrothermograph, maximum and minimum thermometer.	1931–36 [5]	5	1	Do.
Republic	Hygrothermograph	1926–36 [12]	10	1	A. D. Moir, U. S. Forest Service, Republic, Wash.
Chelan National Forest.	do	1925–36 [16]	12	1	P. T. Harris, Chelan National Forest, Okanogan, Wash.
Wisconsin					
Chequamegon National Forest.	Psychrometer	1933–36	3	1	U. S. Forest Service, Washburn, Wis.
Upper Mississippi Erosion Experiment Station.	Transpiration and evaporation, percolation and run-off.	1935–36	2	10	Lake State Forest Experiment Station, Box 643, La Crosse, Wis.

[1] During fire season.
[2] Summer only.
[5] June to October, inclusive.
[6] June 20 to Sept. 30.
[8] 2 stations June 20 to Sept. 30.
[12] June 1 to Sept. 30.
[15] No permanent records; for summer months only.
[16] Apr. 1 to Oct. 30.

LITERATURE RELATING TO GROUND WATER

Most of the literature in the United States in the subject of ground water has been published by the Geological Survey, United States Department of the Interior. The older ground-water papers issued by the Geological Survey were published in the annual reports or in any of several series of publications, but nearly all the more recent papers have been published as water-supply papers, or as parts of water-supply papers called "contributions to hydrology." In recent years many of the ground-water papers prepared by the Geological Survey in cooperation with State agencies have been published by the States. A considerable number of ground-water papers have also been published independently by State geological surveys, State engineering departments, and other State agencies. Numerous short papers relating more or less to the subject of ground water have been published in many different geological and engineering journals. Practically all ground-water papers published since 1928, except those that are purely engineering in character, have been listed in the "annotated bibliography of economic geology," which is issued semiannually under the auspices of the National Research Council.

In 1918 there was published Water-Supply Paper 427, entitled "Bibliography and index of the publications of the United States Geological Survey relating to ground water." This bibliography lists a total of 609 papers (in 454 volumes) which contain information on the subject of ground water, of which 307 papers (in 171 volumes) relate primarily to this subject. Twelve of these papers were published by cooperating agencies.

In the period since 1918 the ground-water work of the Geological Survey has been greatly expanded and intensified, but this trend has not been reflected at all in the volume of publication—largely because of restricted funds available for publication but also because the results of the intensive work as a rule require less voluminous publication than the descriptive material of the earlier papers and there has been a general tendency to publish only the more valuable results and to publish them concisely. Thus a brief mimeographed statement issued at the present time may represent a large amount of intensive work.

From 1919 to 1937, inclusive, about 90 ground-water papers have been published by the Geological Survey, or have been approved for publication, nearly all of them as water-supply papers or contributions to hydrology. In addition, about 60 ground-water papers, prepared by the Geological Survey in cooperation with State agencies, have been published by those agencies or have been approved for publication by them, and about 150 mimeographed papers containing results of scientific work have been issued as memoranda for the press or in other

forms, either by the Geological Survey or by a cooperating party. The Geological Survey has also prepared, largely in recent years, about 800 technical papers of more or less permanent value, which have been placed in typewritten form in an open file that is accessible to the public; and it maintains an open file of unpublished well records, water-level records, and chemical analyses of water. Moreover, much of the scientific product of the ground-water work of the Geological Survey is made available by the publication of short papers in scientific journals. Thus, since 1931 about 50 papers relating to ground water have been contributed by members of the Geological Survey to the Transactions of the American Geophysical Union.

The scope of the work of the ground-water division is shown by its record for the fiscal year ended June 30, 1937. During that year 62 investigations were completed in the division and 75 reports giving technical results were released. Of the reports 5 were published as water-supply papers and 3 as contributions to hydrology; 6 were published by cooperating State or Territorial organizations; 17 were published in technical journals; 31 were mimeographed (chiefly by cooperating States); and 13 were released in typewritten form.

For the 9-year period from 1928 to 1936, the Annotated Bibliography of Economic Geology lists a total of 469 papers published in the United States that relate in whole or in part to ground water, of which 97 are printed or mimeographed papers published by the Geological Survey or cooperating State or Territorial agencies, 23 are papers published by other agencies of the Federal Government, 54 are printed or mimeographed papers prepared by State agencies independently of the Geological Survey, 41 are papers published in the Transactions of the American Geophysical Union, 251 are papers published in other scientific or technical journals or by miscellaneous agencies, and 2 are textbooks on water supply. The papers by other Federal agencies treat largely of soil moisture that has a relation to ground water.

Most of the State geological surveys maintain files of well records, and these files contain a vary large amount of unpublished hydrologic data that are accessible to the public.

The subject of ground water has been only meagerly covered in the American textbooks on geology but somewhat more fully in the textbook entitled "engineering geology," by Heinrich Ries and T. L. Watson, and in a few of the books on hydrology or water supply. There has been great need for a comprehensive textbook on the subject. In 1937 this need was largely met by the publication of a textbook of 593 pages, by C. F. Tolman, entitled "Ground water." About the same time appeared a book of 763 pages by Morris Muskat, entitled "The flow of homogeneous fluids through porous media."

SUPPLEMENTAL BIBLIOGRAPHIC LIST OF PUBLICATIONS WITH ONLY RESTRICTED CIRCULATION

COPIES IN UNITED STATES WEATHER BUREAU LIBRARY

1. Certain climatic features of the two Dakotas, by John P. Finley, 1893; 192 pages. Climatologic and meteorologic data; reduced to monthly and annual summaries. There are 52 stations listed for North Dakota and 75 stations for South Dakota, of which approximately one-half are included in United States Weather Bureau Bulletin W.

2. New York meteorology, by F. H. Hough, 1826–50, published in 1855; 500 pages. Monthly and annual summaries of meteorologic observations made at academies in New York State. Approximately one-half of the 58 station records are included in United States Weather Bureau Bulletin W.

3. New York meteorology, by F. H. Hough, 1850–63, published in 1872; 400 pages. Monthly and annual summaries of meteorologic observations made at academies in New York State. Second series. This publication carries precipitation records up to 1871 for some stations. There are 34 stations listed, only a few of which are continuations of records from the first publication of this series.

4. Rainfall in California, by A. G. McAdie: California Univ. Pub. Geography, vol. 1, no. 4, pp. 127–240, Feb. 19, 1914. This periodical also has records for excessive storms in California, giving the year, month, duration, and inches of rainfall. The record for Summit, 1870–1912, is the only one not included in United States Weather Bureau Bulletin W.

5. Meteorology and climatology of the Great Valleys and Foothills of California, by J. A. Barwick, Signal Corps, United States Army, Sacramento office, 1886; 80-page pamphlet. The only station records not found in United States Weather Bureau Bulletin W are Scotts Valley, 1859–86, and Los Angeles, 1872–77.

6. Climatology of North Carolina, 1820–92, by C. F. Von Hermann, published in 1892, in cooperation with the United States Weather Bureau; 184 pages. Only a minor portion of these records appear in United States Weather Bureau Bulletin W.

7. Climate of Pennsylvania, by Blodget (extracts from annual report of Thomas J. Stewart, secretary of internal affairs of Pennsylvania, for the year 1888), published in 1889; 310 pages of climatologic data. Among the important records not included in United States Weather Bureau Bulletin W are Philadelphia, 1789–1802; Fort Mifflin, 1843–53; Moreland and Horsham, 1864–73; Norristown, 1854–63; Newton, 1838–43; and Plymouth Meeting, 1868–72.

8. Weather Record for New Brunswick, N. J., 1847–90, by P. Vanderbilt Spader, printed in 1890; 414 pages of daily records, including precipitation from May 1862 to April 1890.

9. Harvard Astronomical Observatory Annals, vol. 22, Ed. C. Pickering (Director), published in 1889; 475 pages. Daily meteorologic observations made on the summit of Pikes Peak, under direction of the Chief Signal Officer, United States Army.

10. Michigan crop report, 1886–87, published by the Secretary of State. Monthly publications of about 24 pages each, all bound in a report. Daily precipitation records for 44 stations from July to November 1887.

11. Michigan crop report, 1888, published by the Secretary of State. Monthly publications of about 30 pages each, all bound in a report. Daily precipitation records for 76 stations from December 1887 to November 1888.

12. Michigan crop report, 1889, published by the Secretary of State. Monthly publications of about 30 pages each, all bound in a report. Daily precipitation records for 94 stations from January 1889 to November 1889.

13. Sixth Annual Report of the Massachusetts Agricultural College Meteorological Observatory, 1868, published in 1869; 74 pages. This publication contains 24 pages of meteorologic tables, including daily precipitation of snow and rain in inches. Daily observations made at the Agricultural College and printed as an annual report for the Senate and House.

14. Annual reports of the Ohio Meteorological Bureau, 1885 to 1895. These reports consist of daily records, about 80 pages per month, including precipitation observations at about 60 stations.

15. Nevada Weather Service monthly reports, February to December 1888; about 110 pages. Daily climatologic and meteorologic observations at 35 stations throughout 11 months.

16. Nevada Weather Service monthly reports, June 1895 to August 1897; about 260 pages. Daily climatological and meteorological observations at 60 stations throughout 26 months.

17. Climate in New Mexico, by Linney and Garcia: New Mexico Coll. Agri. and Mechanic Arts Bull. 113, June 1918; 132 pages. These are monthly and annual climatologic and meteorologic summaries, approximately half of which are included in United States Weather Bureau Bulletin W.

MATERIAL IN GENERAL REFERENCE LIBRARIES

18. Climatological history of Ohio: Ohio State Univ. Eng. Exper. Sta., Bull. 26, 1924. This includes records from more than 300 stations.

19. Rainfall and run-off in the Miami Valley, by Ivan E. Houk, Miami Conservancy District, Dayton, Ohio, 1921. Monthly precipitation records above Dayton and yearly precipitation records for several stations.

20. A series of publications of the Division of Water Resources, Department of Public Works, State of California, by the State engineer, 1923 et seq. These publications include seasonal precipitation and run-off records.

21. Characteristic weather phenomena of California, by H. R. Byers; Massachusetts Inst. Technology Meteorol. Papers, vol. 1, no. 2, 54 pages, 1931.

22. Climate of Florida: State Agr. Exper. Sta. Bulletin, by H. A. Mitchell and M. R. Ensign, Gainesville, Fla., 1928.

23. Rainfall in New England, by X. H. Goodnough: New England Water Works Assoc. Jour., vol. 29, No. 3, 158 pages, September 1915. Monthly and annual precipitation records for stations in New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine.

REPORTS OF VARIOUS STATES, METROPOLITAN, OR CONSERVANCY DISTRICTS, AND SPECIAL COMMISSIONS DEALING WITH WATER PROBLEMS

24. Ground-water supplies of the Atlantic City region, by David G. Thompson: New Jersey Dept. Conservation and Devel. Bull 30.

25. Surface water supply of New Jersey, by O. W. Hartwell: New Jersey Dept. Conservation and Devel. Bull. 33, 301 pages, 1929.

26. Control of floods on the Passaic river: New Jersey Water Policy Comm. Special Report 2, 117 pages, 24 plates, 1931.

27. Flow in California streams: Bull. 5, report to the legislature of 1923; 557 pages, 185 plates.

28. Report of Flood Commission of Pittsburgh, Pa., 1911; 2 volumes.

29. Reports of the Water Supply Commission of Pennsylvania, 1914, et esq.

30. Flow of the Rio Grande, International Boundary Commission, 1931 et seq.; also Special flood report, 1932.

31. Hearings and publications of International Joint Commissions of the United States and Canada, only a part of which have attained general circulation.

ARTICLES IN VARIOUS TECHNICAL JOURNALS, PUBLISHING AND DISCUSSING BASIC HYDROLOGIC DATA OR PROBLEMS RELATED THERETO, OF WHICH THE FOLLOWING ARE EXAMPLES FROM THE WRITINGS OF C. E. RAMSER AND OTHERS IN THE UNITED STATES DEPARTMENT OF AGRICULTURE

32. Studies of flow through cleared and uncleared floodways: Eng. News Record, Oct. 12, 1922, p. 599, 2 ills.

33. The flow of water in drainage channels, with special reference to the results of experiments to determine the roughness coefficient "n" in Kutter's formula: Iowa Eng. Soc. Proc. 36th ann. meeting, Jan. 29 to Feb. 1, 1924, 16 pages, 21 ills.

34. Run-off for open ditch land drainage: Am. Soc. Agr. Eng. Trans., 1924, p. 65.

35. Run-off from small agricultural areas: Jour. Agr. Research, reprint, May 1, 1927, p. 797.

36. Resistance of flow in floodway of St. Francis River: Eng. News Record, Apr. 5, 1928, p. 541.

37. The rational method of estimating run-off from small agricultural areas: Engineering and Contracting, August 1928, p. 431.

38. Results of experiments in central Illinois on the flow of water in drainage ditches for cleared and uncleared conditions of channel: Assoc. State Eng. Societies Bull., vol. 3, no. 2, Proceedings of Illinois Soc. Eng., April 1928, pp. 46–54.

REPORTS, BULLETINS, OR MIMEOGRAPHS PREPARED BY C. E. RAMSER AND OTHERS; PUBLISHED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE, OF WHICH THE FOLLOWING SIX ITEMS ARE REPRESENTATIVE

39. Flood control and drainage of the Kootenai River bottoms, Idaho, by C. E. Ramser and L. A. Jones, 43 pages, May 1917.

40. Run-off investigations on the North and South Forked Deer Rivers and other western Tennessee streams, 24 pages, August 1919.

41. Run-off from small agricultural areas, 35 pages, 1925.

42. Progress report for year 1924 on run-off investigation in central Illinois, by C. E. Ramser and R. A. Norton, 32 pages, 1934.

43. Run-off from small agricultural areas: Reprint from Jour. Agr. Research, May 1, 1927, 27 pages.

44. The rational method of estimating run-off from small agricultural areas: Agr. Engineering, November 1929, p. 351.

EXAMPLES OF MISCELLANEOUS UNPUBLISHED HYDROLOGIC DATA, USUALLY OF FRAGMENTARY CHARACTER, FOUND IN PERSONAL DIARIES OF EARLY SETTLERS

45. Diary of Rapin Andrews, 1837–74, Perry Township, Allen County, Ind. This is a typewritten copy of the original record; about 400 pages. It contributes some fragmentary climatic and meteorologic observations, including depths of rain or snow. A file copy is in the possession of the Water Resources Committee, National Resources Committee, Washington, D. C.

46. Various diaries, such as are mentioned in the final column of the tabulation on page 16.

TABULATIONS, CHARTS, AND EXCERPTS

47. Excerpts from or summarizations of basic hydrologic data or characteristics are to be found in either tabulated or graphic form, in various technical treatises, handbooks, journals, bulletins, and reports more or less widely distributed. While these data, of necessity, were derived principally from official publications, they include also records of some observations not readily available elsewhere. Examples are:

Treatises on hydrology, hydroelectric power, and design of dams.

The series of reports by the Chief of Engineers, U. S. Army, under authorization of H. Doc. 308, 69th Congress, first session, on the principal river systems of the United States.

The drainage-basin reports of the Water Resources Committee and the National Resources Committee.

Special regional reports dealing with water conservation and utilization, planning, flood control, and other related problems.

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