Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.

CLIMATOLOGICAL SUMMARY.

By Mr. JAMES BERRY, Chief of the Climatological Division.

TEMPERATURE AND PRECIPITATION BY SECTIONS, JULY, 1906.

In the following table are given, for the various sections of the Climatological Service of the Weather Bureau, the average temperature and rainfall, the stations reporting the highest and lowest temperatures with dates of occurrence, the stations reporting greatest and least monthly precipitation, and other data, as indicated by the several headings.

The mean temperatures for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperature and precipitation are based only on records from stations that have ten or more years of observation. Of course the number of such records is smaller than the total number of stations.

Section.	Temperature—in degrees Fahrenheit.								Precipitation—in inches and hundredths.					
	Section average.	Departure from the normal.	Monthly extremes.						Section average.	Departure from the normal.	Greatest monthly.		Least monthly.	
			Station.	Highest.	Date.	Station.	Lowest.	Date.			Station.	Amount.	Station.	Amount.
Alabama	78.8	− 1.2	6 stations	100	1	Riverton	55	4	8.50	+3.50	Maple Grove	14.11	Thomasville	3.35
Arizona	81.9	− 0.3	Fort Mohave	122	24	Quakingasp	30	3	1.94	+0.28	Pinal Ranch	5.33	Mohawk Summit	0.00
Arkansas	76.7	− 3.4	6 stations	99	5 dates	Ozark	48	3	5.96	+2.17	Arkansas City	12.95	La Crosse	0.97
California	76.8	+ 2.7	Indio	120	24	Tamarack	28	15	0.04	−0.01	Montague	1.27	Many stations	0.00
Colorado	63.4	− 3.2	Lamar Las Animas	101 101	23 3 dts.	Breckenridge Longs Peak	27 27	5 3	2.50	+0.28	Stonewall	7.44	Manassa	0.09
Florida	81.0	− 0.5	Fort Meade Marianna	99 99	22 9	DeFuniak Springs	60	1,2	9.50	+2.40	Brooksville	20.54	Key West	1.92
Georgia	77.9	− 2.0	Elberton Marshallville	101 101	1 1	Diamond	56	10	8.41	+3.21	St. Marys	20.03	Macon	3.88
Hawaii	†74.7	.....	Pahala, Hawaii	95	18	Volcano House, Ha.	50	5	‡5.36	.....	Honomanu Val, Maui	20.22	4 stations	0.00
Idaho	70.6	+ 3.4	Garnet	108	21	Forney, Lake	34	1	0.19	−0.36	Salem	1.32	9 stations	0.00
Illinois	73.9	− 1.8	Bloomington Palestine	100 100	22 1	Streator	43	5	2.41	−1.08	Carlinville	7.73	2 stations	0.47
Indiana	73.7	− 1.9	Mount Vernon Salem	97 97	11 19	Plymouth	45	23	3.15	−0.03	Vevay	7.95	Salem	0.57
Iowa	70.9	− 3.5	Atlantic	102	21	Washta	42	7,8	3.04	−1.31	Independence	7.05	Tipton	0.26
Kansas	73.8	− 4.0	Coolidge	102	31	Wallace	42	4	4.65	+0.82	Yates Center	9.46	Oberlin	1.71
Kentucky	75.2	− 2.1	Highbridge	100	2	Farmers Greensburg	51 51	25 25,27	6.02	+1.92	Williamsburg	11.52	Franklin	2.03
Louisiana	81.3	− 0.3	Alexandria Reserve	102 102	1 1,6,9	Plain Dealing Ruston	60 60	4 5	7.97	+2.45	Franklin	13.84	Crowley	2.55
Maryland and Delaware	74.0	− 1.3	Cambridge, Md Porto Bello, Md	96 96	1,2 19	Deer Park, Md Oakland, Md	42 42	25 25	5.20	+0.40	Seaford, Del	11.56	Cumberland, Md	1.64
Michigan	67.7	− 1.0	Hagar Jackson	98 98	14 22	3 stations	33	3 dates	2.57	−0.37	Grape	5.93	Sault Sainte Marie	0.22
Minnesota	68.3	− 1.3	Wabasha	97	1	Hovland	38	2	2.93	−0.70	Wadena	7.42	Two Harbors	0.43
Mississippi	79.3	− 1.7	Magnolia	102	1	Duck Hill	56	5	5.99	+1.06	Corinth	15.88	Hazlehurst	2.82
Missouri	74.7	− 2.5	3 stations	100	22	Louisiana	48	25	3.53	−1.00	Bolivar	8.18	Darksville	0.40
Montana	67.6	+ 2.0	Plentywood	109	29	Grayling	28	15,28	0.59	−0.91	Nye	2.64	2 stations	0.00
Nebraska	70.2	− 3.6	Fairbury	102	20	Agate	38	4	2.70	−0.76	University Farm	7.88	Springview	0.37
Nevada	74.7	+ 4.2	Logan	114	21,22	Potts	32	25	0.68	+0.31	Palmetto	4.58	3 stations	0.00
New England*	69.1	− 0.3	Van Buren, Me	97	14	Grafton, N. H. Patten, Me	35 35	6 6	4.64	+0.77	Voluntown, Conn	8.17	Danielson, Conn	1.89
New Jersey	72.8	− 1.0	3 stations	94	3 dates	Charlotteburg Layton	46 46	8 7	5.58	+0.32	Sandy Hook	8.28	Englewood	3.44
New Mexico	70.2	− 2.6	San Marcial	110	22,23	Chama	34	5,6	3.48	+1.01	Nara Visa	8.29	Magdalena	0.28
New York	69.4	− 0.2	Elmira	94	20	Indian Lake	35	6	3.74	−0.56	Setauket	8.62	Moira	1.85
North Carolina	75.6	− 1.6	3 stations	100	1	Pink Beds	46	10,28	9.23	+3.38	Selma	17.15	Asheville	4.60
North Dakota	66.9	− 0.6	Melville	102	20	McKinney	34	17	1.97	−0.53	Berlin	5.92	Sentinel Butte	0.13
Ohio	72.1	− 1.8	Norwalk	98	19	Garrettsville Medina	43 43	25 25	5.14	+1.17	Springfield	10.25	Willoughby	1.56
Oklahoma and Indian Territories.	76.5	− 4.2	Mangum, Okla	103	27	Kenton, Okla	50	6	5.26	+1.64	Harrington, Okla	8.74	Cache, Okla	0.92
Oregon	71.3	+ 6.5	Umatilla	115	4	Granite Silver Lake	31 31	27 18	0.14	−0.52	Odell	2.07	23 stations	0.00
Pennsylvania	71.3	− 0.7	Bellefonte	95	2	Baldwin	38	2	4.31	−0.47	Kennett Square	8.98	Hyndman	1.41
Porto Rico	78.3	.....	Adjuntas Guanica	95 95	21,22 25	Adjuntas Corozal	53 53	11 16,24	8.09	.....	Rio Blanco	18.42	Guanica	1.30
South Carolina	78.4	− 1.3	Yorkville	100	1	Trenton	56	13	8.40	+2.71	Clemson College	17.77	Little Mountain	4.01
South Dakota	69.6	− 2.3	Cherry Creek	107	21	Ashcroft Rosebud	38 38	15 3	1.45	−1.32	Tyndall	3.42	Kennebec	0.18
Tennessee	75.2	− 2.1	3 stations	100	1	Hohenwald	48	5	6.90	+2.82	Rugby	16.82	Trenton	1.71
Texas	80.3	− 2.0	Big Springs	108	23	Claytonville	40	4,9	4.71	+1.51	Alvin	12.50	Corpus Christi	0.41
Utah	71.6	− 0.1	St. George	110	6	Coyoto	26	1	0.85	+0.08	Tropic	2.99	3 stations	T.
Virginia	74.0	− 1.7	Rocky Mount	101	1	Blacksburg Burkes Garden	43 43	19 10	6.05	+1.33	Callaville	10.69	Lincoln	2.66
Washington	72.4	+ 5.6	Mottingers Ranch	112	4,21	Centralia Goldendale	39 39	8 26	0.17	−0.44	Colville	0.74	8 stations	0.00
West Virginia	72.4	− 1.3	Berkeley Springs Sutton	98 98	1 13	Bayard	45	25	4.54	−0.33	Princeton	7.44	Moorfield	1.50
Wisconsin	68.7	− 1.5	Prairie du Chien	96	11	Prentice	36	5	2.55	−1.36	Florence	6.10	2 stations	0.79
Wyoming	62.3	− 2.1	Alcova	103	21	Soda Butte, Y. N. P.	25	3	1.14	−0.05	Alcova	2.43	Green River	0.02

* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. † 49 stations, with an average elevation of 645 feet. ‡ 142 stations.

THE WEATHER OF THE MONTH.

By Mr. P. C. DAY, Assistant Chief, Division of Meteorological Records.

PRESSURE.

The distribution of atmospheric pressure for July over the United States and Canada is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and V.

The isobaric chart shows well-marked variations from normal conditions and is probably without parallel during any July in the history of the Weather Bureau.

The persistence of areas of high pressure over the northern Rocky Mountain slope and upper Missouri Valley was very

unusual and instead of the normal summer extension of the southwestern low over that region there appears a well-defined area of high pressure. The high pressure area that normally extends well into the South Atlantic and East Gulf States receded eastward during July and its influence on the prevailing weather over that section was correspondingly lessened.

Pressure on the Pacific coast was somewhat lower than the average, especially over the region between the Coast and Cascade ranges of mountains, while over the New England States and the Canadian Maritime Provinces the pressure was above the average.

The pressure usually increases from June to July over all portions of the United States and Canada, except over a limited area on the coast of California and over parts of New England and in the St. Lawrence Valley. During the present season the increase from June to July was especially marked over the entire Rocky Mountain and eastern Plains region from the Mexican boundary as far north as the field of observation extends. As a result of this unusual distribution of pressure the surface winds of the Mississippi Valley and southern slope regions were materially deflected from their normal southerly and easterly course during July, and blew largely from northerly or westerly points.

TEMPERATURE.

The continued high pressure over the northern Rocky Mountain and slope regions brought to that section the usual cool weather accompanying high pressure areas and in conjunction with the decreased pressure over the South Atlantic and Gulf States affected correspondingly the weather over nearly the entire area of the United States east of the Rocky Mountains.

Over the southern slope and Mississippi Valley cool northerly winds predominated with temperatures much below the normal.

Over the territory from central Texas to South Dakota, and from Colorado and Wyoming east to the Mississippi Valley, the daily temperatures averaged from 2° to more than 4° below the normal. In portions of the above region the average for the month was the lowest recorded in any July in a period of over thirty years.

West of the Rocky Mountains and north of the Canadian boundary the temperature was above the average. Over the eastern parts of Washington and Oregon the daily temperatures were exceptionally high throughout practically the whole month. At Spokane and Walla Walla, Wash., and Baker City, Oreg., the monthly means were the highest on record for July.

Maximum temperatures east of the Rocky Mountains were, as a rule, moderate; over large sections of New England, the Middle Atlantic States, and the Lake region the maximum temperatures did not reach 90°. Over small areas in Alabama, southern and western Texas, Oklahoma, South Dakota, and Montana maximum temperatures of 100°, or more, were recorded. West of the Rocky Mountains maximum temperatures were unusually high. Over the greater portion of southwestern Arizona and southeastern California maximum temperatures of 110° to 120° were recorded, and over the whole of northern California, except the coast and mountain districts, and the greater parts of Oregon and Washington readings from 100° to 110° were recorded. In western Washington the maximum temperatures on the 3d were the highest ever recorded in that section.

Temperatures below freezing were recorded at a few mountain stations in Colorado and Wyoming.

In Canada.—Prof. R. F. Stupart says:

The mean temperature of the month was above the average in nearly all parts of the Dominion, districts near Lake Superior and southwestern Ontario alone showing a very slight negative departure. A positive departure of 2° in eastern Manitoba increased westward to 6° in parts of Alberta and in British Columbia, while over the larger portions of Ontario, Quebec, and the Maritime Provinces the positive departure ranged between 1° and 3°.

PRECIPITATION.

The usual heavy rains over the lower Mississippi Valley and Gulf States prevailed during the month, and amounts in excess of 10 inches were recorded in scattered localities in that section. Heavy rains for the season occurred generally over Texas and in a narrow belt along the eastern slope of the Continental Divide from central New Mexico to southern Wyoming. In the latter section the fall was unusually heavy, especially at the higher elevations where rains were of almost daily occurrence, and the totals for the month were the largest on record.

Over nearly all sections east of the one hundredth meridian, except the Dakotas and the upper Mississippi Valley, the month was one of abundant rainfall. The usual summer rains prevailed over Arizona and New Mexico, and amounts from 4.00 to over 8.00 inches were recorded at numerous points in those Territories.

On the Pacific coast and generally over the Plateau region the precipitation was deficient. It was also less than average over the northern tier of States as far east as the upper Lake region.

In Canada.—Prof. Stupart says:

The rainfall was deficient over the greater part of the Dominion, but over the more central counties of Ontario and the southern portion of Nova Scotia it was excessive, the largest departures recorded being in the districts between Halifax and Yarmouth, Nova Scotia. In the western provinces the most pronounced deficiency occurred in southeastern Alberta, where the fall was very scant, while in northern parts and in Manitoba it was more nearly average. In Ontario just west of the Ottawa Valley the fall was decidedly deficient, and this was also the case in northern New Brunswick and eastern Quebec.

HUMIDITY AND CLOUDINESS.

The humidity was equal to or in excess of the average over all sections of the United States, none of the geographical divisions showing values below normal. The month was also one of general excess of cloudiness, except in the Lake region, the upper Mississippi and Missouri valleys, and generally over the Pacific coast.

The average and extreme values of the principal climatological data are given for each station in Tables I–VI, but the averages by districts are summarized in the following tables:

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	9	68.0	− 1.0	+ 3.2	+ 0.5
Middle Atlantic	13	74.1	− 0.7	+ 5.3	+ 0.8
South Atlantic	10	77.6	− 1.5	− 1.1	− 0.2
Florida Peninsula*	8	81.1	− 0.4	− 1.0	− 0.1
East Gulf	8	79.4	− 1.2	− 8.0	− 1.1
West Gulf	7	80.5	− 1.5	− 4.0	− 0.6
Ohio Valley and Tennessee	12	74.6	− 1.8	− 2.7	− 0.4
Lower Lake	8	70.9	− 0.3	+ 5.7	+ 0.8
Upper Lake	10	67.6	− 0.2	+10.0	+ 1.4
North Dakota*	8	67.5	− 0.5	+14.1	+ 2.0
Upper Mississippi Valley	13	72.7	− 2.1	+ 0.8	+ 0.1
Missouri Valley	11	72.4	− 2.8	+ 6.6	+ 0.9
Northern Slope	7	68.7	− 0.7	+ 7.2	+ 1.0
Middle Slope	6	72.6	− 3.6	+ 0.8	+ 0.1
Southern Slope*	6	76.4	− 2.9	− 7.1	− 1.0
Southern Plateau*	13	77.9	− 0.8	+ 2.6	+ 0.4
Middle Plateau*	8	71.6	+ 0.8	+ 0.8	+ 0.1
Northern Plateau*	12	74.5	+ 6.4	+12.3	+ 1.8
North Pacific	7	64.6	+ 3.3	+10.6	+ 1.5
Middle Pacific	5	65.8	+ 1.4	+ 9.8	+ 1.4
South Pacific	4	72.9	+ 2.2	+ 6.0	+ 0.9

* Regular Weather Bureau and selected cooperative stations.

Average precipitation and departures from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	9	3.99	111	+0.4	+1.0
Middle Atlantic	13	5.65	133	+1.4	−0.5
South Atlantic	10	7.51	127	+1.6	+0.2
Florida Peninsula*	8	9.65	147	+3.1	+7.9
East Gulf	8	7.11	129	+1.6	−3.6
West Gulf	7	4.04	129	+0.9	−6.3
Ohio Valley and Tennessee	12	5.03	122	+0.9	−5.5
Lower Lake	8	4.02	129	+0.9	−4.1
Upper Lake	10	2.31	77	−0.7	−2.2
North Dakota*	8	1.58	61	−1.0	+1.8
Upper Mississippi Valley	13	2.33	61	−1.5	−2.6
Missouri Valley	11	2.95	69	−1.3	−2.7
Northern Slope	7	1.12	65	−0.6	+0.2
Middle Slope	6	3.92	134	+1.0	−1.4
Southern Slope*	6	3.90	122	+0.7	+0.5
Southern Plateau*	13	1.81	138	+0.5	+2.2
Middle Plateau*	8	0.88	129	+0.2	+3.6
Northern Plateau*	12	0.19	28	−0.5	−0.3
North Pacific	7	0.14	15	−0.8	−7.6
Middle Pacific	5	0.02	17	−0.1	+4.6
South Pacific	4	T.	100	0.0	+6.4

* Regular Weather Bureau and selected cooperative stations.

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Columbus, Ohio	3	52	nw.	Point Reyes Light, Cal	30	50	nw.
Denver, Colo	14	52	n.	Do	31	56	nw.
Lincoln, Nebr	1	60	nw.	Peoria, Ill	28	50	w.
Do	25	51	n.	Port Huron, Mich	22	52	nw.
New York, N. Y	17	55	w.	Topeka, Kans	1	56	w.

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.6	+ 0.7	Missouri Valley	4.1	− 0.3
Middle Atlantic	5.9	+ 1.1	Northern Slope	2.9	− 0.9
South Atlantic	6.4	+ 1.4	Middle Slope	4.7	+ 0.7
Florida Peninsula	4.9	− 0.1	Southern Slope	5.4	+ 1.2
East Gulf	6.1	+ 1.1	Southern Plateau	3.9	+ 0.4
West Gulf	5.1	+ 0.9	Middle Plateau	3.8	+ 0.6
Ohio Valley and Tennessee	5.7	+ 1.1	Northern Plateau	2.1	− 0.6
Lower Lake	4.6	+ 0.1	North Pacific	4.0	− 0.1
Upper Lake	4.2	− 0.5	Middle Pacific	4.2	+ 0.2
North Dakota	3.9	− 0.4	South Pacific	2.4	− 0.4
Upper Mississippi Valley	4.1	− 0.2			

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	85	+ 5	Missouri Valley	67	+ 1
Middle Atlantic	78	+ 4	Northern Slope	57	+ 5
South Atlantic	84	+ 4	Middle Slope	67	+ 7
Florida Peninsula	80	0	Southern Slope	68	+ 9
East Gulf	81	+ 3	Southern Plateau	49	+ 9
West Gulf	77	+ 3	Middle Plateau	46	+ 9
Ohio Valley and Tennessee	76	+ 7	Northern Plateau	40	0
Lower Lake	73	+ 4	North Pacific	75	0
Upper Lake	73	+ 1	Middle Pacific	68	+ 3
North Dakota	74	+ 5	South Pacific	66	+ 2
Upper Mississippi Valley	68	0			

DESCRIPTION OF TABLES AND CHARTS.

By Mr. P. C. DAY, Assistant Chief, Division of Meteorological Records.

For description of tables and charts see page 38 of REVIEW for January, 1906.