

# CLIMATOLOGICAL DATA.

## IOWA SECTION

11

In co-operation with

IOWA WEATHER AND CROP BUREAU

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VOL. XLIII DES MOINES, IOWA, JANUARY, 1932 No. 1

### GENERAL SUMMARY

The mean temperature for the State, 22.5°, was 4.2° above normal, and 6.4° colder than January, 1931. The maximum temperature for the stations occurred on scattered dates. With only a few exceptions, the lowest temperature for the month was recorded on either the 30th or 31st. At several stations in southern Iowa and along the Mississippi as far north as Dubuque, the temperature fell below the zero mark on the 29th, the first sub-zero weather since January, 1930, a remarkable record for these stations. At Davenport a period of 427 days, November 29, 1930 to January 29, 1932, had been without zero temperatures.

State-wide precipitation averaged 1.81 inches, or 0.78 inch above normal, and 1.31 inches greater than for January last year. This is the fifth consecutive month with precipitation in excess of normal. The extreme east central and southeast districts were the only localities receiving less than normal amounts of precipitation. Most of the precipitation fell on the 1st, 5th, 14th, 15th, 16th and 26th.

Snowfall averaged 200% of normal. The western one-third of the State received more snow than did the eastern two-thirds. The northwest half had measurable amounts on the ground the entire month. The northwest district had the greatest depth of snow cover on the 31st. Snow rollers were observed on the 26th and 27th in several localities in western Iowa.

Sunshine was decidedly lacking throughout January, amounting to only 37% of the possible. Sioux City received the greatest amount, 47%, of possible, and Dubuque the least, 24%.

Alternate freezing and thawing of the ground to a depth of 4 to 5 inches may have hurt some of the fall seeding of grasses. Newly seeded clover and alfalfa will also probably suffer. Subsoil apparently has regained the normal supply of moisture.

The Mississippi River was open to navigation the entire month. This was the first time in the history of the Dubuque station that the river channel did not gorge or freeze over before the close of January. The Missouri River at both Sioux City and Omaha remained open the entire month. Very little harvest of natural ice was done anywhere in the State.

Glaze storms occurred over most of the western half of the State on the 1st, and also the period 14th-17th, which made highway and street traffic extremely hazardous. Some damage was done to telephone and power lines and trees.

### COMPARATIVE DATA FOR THE STATE—JANUARY

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre. .01 in. or more	Clear	Partly cloudy	Cloudy
1873	12.0	-6.3	55	-38	2.53	+1.50	3.56	0.50					
1874	19.6	+1.3	64	-24	1.67	+0.64	4.72	0.22					
1875	4.9	-13.4	48	-30	0.82	-0.21	1.61	0.38					
1876	23.5	+5.2	62	-16	1.49	+0.46	3.96	0.00					
1877	13.7	+4.6	58	-31	1.09	+0.06	3.04	0.37					
1878	25.4	+7.1	55	-13	0.48	-0.55	5.00	0.00					
1879	16.1	-2.2	54	-30	0.48	-0.55	1.48	0.00					
1880	32.0	+13.7	68	-6	1.36	+0.33	4.52	0.20					
1881	9.6	-8.7	48	-40	0.94	-0.09	3.10	0.04					
1882	23.4	+5.1	60	-17	0.65	-0.38	1.80	0.09					
1883	8.0	-10.3	46	-38	1.31	+0.20	2.85	0.35					
1884	13.3	-5.0	52	-38	0.52	-0.51	1.50	0.02					
1885	9.4	-8.9	51	-42	1.28	+0.25	3.72	0.18					
1886	8.1	-10.2	52	-33	2.59	+1.56	4.85	0.68					
1887	8.8	-9.5	55	-34	1.13	+0.10	2.92	0.04					
1888	5.4	-12.9	58	-43	1.30	+0.27	4.00	0.40					
1889	21.6	+3.3	62	-25	1.22	+0.19	2.30	0.50					
1890	18.0	+0.3	64	-27	1.79	+0.76	3.46	0.35					
1891	26.0	+7.7	58	-4	1.75	+0.72	3.99	0.61		4	13	7	11
1892	15.3	-3.0	76	-38	1.09	+0.06	3.13	0.10		6.9	5	16	9
1893	9.3	-9.0	54	-34	0.74	-0.29	3.20	0.13		6.9	6	11	9
1894	19.3	+1.0	69	-37	1.09	+0.06	2.24	0.31		6.0	5	14	9
1895	15.6	-4.7	68	-31	0.85	-0.18	2.65	0.09		8.7	4	15	7
1896	23.2	+5.1	68	-20	0.48	-0.55	2.10	T.		8.2	3	10	10
1897	17.2	-1.1	66	-30	2.01	+0.98	6.16	0.15		2.8	7	12	7
1898	23.4	+5.1	52	-11	1.60	+0.57	5.32	T.		12.6	5	15	6
1899	19.8	+1.5	68	-34	0.28	-0.75	1.15	T.		1.5	3	15	10
1900	25.6	+7.3	66	-20	0.53	-0.50	2.47	T.		2.3	3	16	7
1901	23.7	+5.4	60	-21	0.74	-0.29	2.34	0.04		6.2	4	14	9
1902	22.4	+4.1	63	-31	0.88	-0.15	2.83	0.19		9.4	4	17	8
1903	23.0	+4.7	60	-12	0.28	-0.75	1.46	T.		2.0	4	13	7
1904	14.0	-4.3	57	-32	1.18	+0.15	3.68	0.02		6.1	6	12	8
1905	11.2	-7.1	56	-30	0.91	-0.12	1.82	0.12		11.1	7	14	7
1906	24.6	+6.3	69	-19	1.52	+0.49	4.71	0.28		11.3	5	14	6
1907	18.8	+0.5	68	-22	1.52	+0.49	5.30	0.10		6.0	7	8	7
1908	24.9	+6.6	60	-18	0.44	-0.59	1.50	0.06		4.8	2	17	8
1909	21.2	+2.9	72	-25	1.66	+0.63	3.74	0.41		7.8	6	9	6
1910	18.1	-0.2	56	-35	1.57	+0.54	3.15	0.55		12.6	6	13	7
1911	20.2	+1.9	66	-35	0.97	-0.06	3.73	0.11		7.3	5	9	8
1912	4.2	-14.1	49	-47	0.53	-0.50	1.90	T.		5.5	5	14	7
1913	20.9	+2.6	62	-25	0.77	-0.26	2.05	0.04		7.2	5	14	9
1914	27.8	+9.5	64	-10	0.88	-0.15	2.34	0.27		5.1	5	11	8
1915	17.5	-0.8	59	-32	1.63	+0.60	3.15	0.10		7.3	8	13	8
1916	17.8	-0.5	63	-34	2.62	+1.59	6.07	0.85		7.2	10	12	6
1917	17.0	-1.3	60	-28	0.83	-0.20	2.07	0.17		7.2	4	17	8
1918	8.6	-9.7	53	-35	1.02	-0.01	2.79	0.26		11.2	7	13	8
1919	26.8	+8.5	64	-32	0.24	-0.79	0.86	T.		2.8	2	20	5
1920	16.7	-1.6	58	-26	0.42	-0.61	1.05	T.		4.6	4	12	8
1921	28.4	+10.1	67	-9	0.51	-0.52	1.92	0.10		4.1	4	11	7
1922	19.8	+1.5	57	-29	0.89	-0.14	2.30	0.32		5.3	4	17	6
1923	26.7	+8.4	58	-10	0.85	-0.18	2.34	T.		6.5	6	10	7
1924	13.9	-4.4	59	-36	0.89	-0.14	2.47	0.06		5.5	5	17	7
1925	19.4	+1.1	55	-24	0.40	-0.63	1.23	0.05		4.2	3	17	7
1926	22.7	+4.4	58	-22	1.09	+0.06	2.68	0.31		5.0	7	11	8
1927	21.7	+3.4	59	-27	0.29	-0.74	1.10	T.		3.0	4	14	8
1928	25.2	+6.9	70	-20	0.17	-0.86	1.04	T.		0.9	3	15	8
1929	10.2	-8.1	47	-29	2.06	+1.03	4.10	0.40		17.5	9	11	6
1930	10.5	-7.8	58	-37	1.33	+0.30	2.51	0.51		14.7	8	14	8
1931	28.9	+10.6	64	-15	0.50	-0.53	0.97	T.		5.1	2	18	6
1932	22.5	+4.2	61	-22	1.81	+0.78	3.40	0.42		13.6	8	9	6
Normals	18.3		60	-27	1.03		2.91	0.18		6.8	5	14	7
Highest	32.0		76	-4	2.62		6.16	0.85		17.5	10	20	10
Lowest	4.2		46	-47	0.17		0.86	0.00		0.9	2	8	5

T. indicates an amount too small to measure, or less than .005 inch rainfall and less than .05 inch snowfall.

### TEMPERATURE

The mean temperature for the State, derived from the means of 9 districts of nearly equal area, and based on the records of 104 stations, was 22.5°, or 4.2° above normal. All of the Iowa stations had precipitation in excess of normal, except Sioux City, Little Sioux, Onawa, Glenwood and Omaha, Nebraska. The greatest district excess, 7.7°, was in the southeast district, and the least district excess, 0.8°, was in the west central district. The highest monthly mean was 32.7° at Keokuk and the lowest, 13.9°, at Inwood (near). The absolute range in temperature for the State was 83°, ranging from 61° at Keokuk on the 28th to -22° at Washta and Forest City on the 31st and Little Sioux on the 30th. There was a well defined radiation cold wave on the night of the 8th-9th in several central and northwest counties.



Climatological Data for January, 1932

STATIONS	COUNTIES	Elevation, feet	Length of record, years	Temperatures, in Degrees Fahrenheit						Precipitation, in inches				Number of Days			Prevailing direction of wind	OBSERVERS			
				Mean	Departure from normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from normal	Greatest in 24 hours	Total snowfall (unmelted)	Precipitation, .01 in. or more	Clear			Partly cloudy	Cloudy	
<i>Northwest District</i>																					
Akron.....	Plymouth	1,153	5									1.44	+ 0.84	0.40	22.5	7	12	14	5	n.	Orlan C. Moore
Alta.....	Buena Vista	1,513	42	15.6	+ 0.8	36	12†	-18	30	33	2.84	+ 2.11	1.22	27.0	6	13	2	15	n.w.	D. E. Hadden	
Alton.....	Sioux	1,305	27	15.4	+ 0.5	39	12	-16	30	39	2.40	+ 1.66	0.50	24.0	9	8	2	15	n.w.	W. S. Stagle	
Cherokee.....	Cherokee	1,196	12	15.4	0.0	38	12	-18	30†	31	1.80	+ 1.20	0.46	29.5	9	8	8	15	s.	J. E. Wirth	
Estherville.....	Emmet	1,298	38	16.9	+ 3.9	38	12	-21	31	33	1.83	+ 1.23	0.50	24.0	8	17	8	6	n.w.	A. O. Peterson	
Hawarden.....	Sioux	1,181	6								1.27	+ 0.67	0.37	19.8	8	14	3	14	n.w.	Earl V. Slife	
Inwood (near).....	Lyon	1,174	29	13.9	+ 0.8	38	19	-19	31	33	1.23	+ 0.59	0.44	13.7	7	12	5	14	n.w.	A. C. Hanson	
Lake Park (near).....	Dickinson	1,489	20	14.3	+ 1.8	36	12	-21	31	36	1.09	+ 0.46	0.45	11.0	6				n.w.	P. M. Lawrence	
Le Mars.....	Plymouth	1,224	41	16.2	+ 0.2	39	12†	-15	30	31	2.83	+ 2.24	0.80	28.3	8	12	3	16	n.w.	Henry Newell	
Marathon.....	Buena Vista	1,390	6								3.11	+ 2.41	0.89	31.4	11	10	1	20	n.w.	E. G. Smith	
Pocahontas.....	Pocahontas	1,248	28	16.2	+ 1.1	39	19	-18	29†	47	2.26	+ 1.54	0.70	24.6	9	12	4	15	n.w.	F. E. Hronek	
Rock Rapids.....	Lyon	1,349	35	15.2	+ 1.7	37	12†	-17	30†	34	1.20	+ 0.52	0.35	18.8	8	17	3	11	n.	Nellie F. Medberry	
Sanborn.....	O'Brien	1,553	19	14.8	+ 1.8	38	12	-21	31	34	2.29	+ 1.46	0.60	22.0	7	7	6	18	sw.	J. W. Dow	
Sheldon.....	O'Brien	1,418	26	14.6	+ 1.3	38	12	-19	30	38	2.05	+ 1.24	0.74	20.5	9	9	7	15	n.w.	Ross E. Forward	
Sioux Center.....	Sioux	1,455	33	15.9	+ 1.8	38	12†	-20	30	34									n.w.	Joe te Veltrup	
Spencer.....	Clay	1,319	24	15.7	+ 2.1	37	25	-20	31	34	2.40	+ 1.74	0.75	32.0	9	11	8	12	n.w.	E. W. Little	
Storm Lake.....	Buena Vista	1,442	42	16.0	+ 0.5	37	12†	-20	30	36	3.40	+ 2.76	0.96	27.0	7	10	4	17	n.w.	Russel M. Edwards	
Washta.....	Cherokee	1,157	35	16.1	0.0	41	12†	-22	31	39	2.79	+ 2.17	1.00	27.7	6	12	2	17	n.w.	H. L. Felter	
West Bend.....	Palo Alto	1,197	45	17.2	+ 2.8	39	12†	-19	30	37	1.89	+ 1.05	0.55	24.5	8	9	10	12	n.w.	Jos. Dorweiler	
Means and extremes.....				15.6	+ 1.3	41	12†	-22	31	47	2.11	+ 1.43	1.22	23.8	8	11	6	14	n.w.		
<i>North Central District</i>																					
Algona.....	Kossuth	1,207	71	17.4	+ 2.5	39	12†	-19	31	39	1.96	+ 1.05	0.65	34.0	10	10	8	13	n.w.	Leon M. Merritt	
Allison (near).....	Butler	1,000	18	19.4	+ 5.4	38	12†	-16	30	33	1.66	+ 0.66	1.01	17.0	10	9	7	15	n.w.	George H. Bell	
Belmond.....	Wright	1,178	23	18.4	+ 4.2	42	13	-17	30	36	1.64	+ 0.52	0.60	10.3	9	9	10	12	n.w.	T. A. Davenport	
Britt.....	Hancock	1,236	47	17.7	+ 3.1	39	12†	-19	31	34	3.01	+ 2.26	0.71	27.0	10	10	2	19	n.w.	E. P. Healy	
Charles City.....	Floyd	1,015	57	19.4	+ 5.7	40	25	-15	31	40	2.37	+ 1.32	0.85	16.5	11	6	5	20	sw.	U. S. Weather Bureau	
Forest City.....	Winnebago	1,226	42	16.2	+ 2.0	39	12	-22	31	36	2.54	+ 1.62	0.55	25.1	14	8	5	18	sw.	Dr. M. B. Neil	
Hampton.....	Franklin	1,142	41	19.6	+ 4.7	40	12†	-16	30	36	1.51	+ 0.40	0.63	21.0	5	24	0	7	n.w.	Howard J. Haydon	
Humboldt.....	Humboldt	1,095	48	17.6	+ 2.3	41	12	-16	30†	35	1.06	+ 0.16	0.60	17.0	5	12	6	13	n.w.	H. C. Snitkey	
Mason City.....	Cerro Gordo	1,148	40	17.2	+ 3.7	39	25	-19	31	39	1.77	+ 0.85	0.65	20.0	11	8	8	15	n.w.	Amer. Beet Sugar Co.	
Northwood.....	Worth	1,222	36	16.1	+ 3.0	38	19	-21	31	37	2.52	+ 1.51	0.70	25.0	11	8	8	15	n.w.	Charles Dwelle	
Osage.....	Mitchell	1,163	47	18.0	+ 4.6	38	12†	-19	31	40	2.11	+ 1.01	0.81	21.0	10	7	8	16	n.w.	Dr. C. E. Juhl	
Means and extremes.....				17.9	+ 3.6	41	12	-22	31	40	2.01	+ 1.03	1.01	21.3	10	10	6	15	n.w.		
<i>Northeast District</i>																					
Cedar Falls.....	Black Hawk	875	13								2.55	+ 1.45	0.90	16.2	14	7	7	17	n.w.	E. J. Cable	
Decorah.....	Winneshek	872	49	21.4	+ 6.8	40	12†	-16	31	36	2.70	+ 1.57	0.80	19.0	9	7	8	16	n.w.	M. D. Whitney	
Delaware (near).....	Delaware	1,083	53	23.4	+ 6.4	46	25	-12	31	35	1.19	+ 0.00	0.53	3.2	7	8	7	16	n.w.	E. J. Paris	
Dubuque.....	Dubuque	700	81	26.5	+ 7.4	46	25	-8	31	38	1.21	+ 0.09	0.41	3.1	8	7	4	20	n.w.	U. S. Weather Bureau	
Fayette.....	Fayette	1,003	44	22.1	+ 6.1	45	25	-12	31	36	1.94	+ 0.74	0.77	17.4	12	10	2	19	w.	W. C. Van Ness	
Independence.....	Buchanan	956	72	22.6	+ 4.9	43	25	-11	31	33	2.14	+ 1.00	0.64	17.8	11	8	2	21	sw.	Dr. George Boody	
Lansing.....	Allamakee	632	29																sw.	Mrs. Mary Spinner	
New Hampton.....	Chickasaw	1,169	35																sw.	D. W. Dawson	
Oelwein.....	Fayette	1,036	9	22.6	+ 6.1	44	25†	-11	31	30	2.51	+ 1.36	0.61	16.0	8	8	0	23	n.w.	John T. Ridler	
Postville (near).....	Clayton	1,192	41	20.8	+ 5.5	45	25	-15	31	35	1.54	+ 0.38	0.50	10.7	10	11	5	15	sw.	F. L. Williams	
Waterloo.....	Black Hawk	851	50	22.3	+ 5.1	45	25	-11	30†	33	2.10	+ 1.05	0.75	15.5	11	9	4	18	n.w.	R. B. Slippery	
Waverly.....	Bremer	936	43	20.8	+ 5.2	41	13†	-13	30†	39	2.17	+ 1.05	0.87	17.6	8	11	8	12	n.e.	D. H. Murphy	
Means and extremes.....				22.5	+ 6.2	46	25	-16	31	39	2.00	+ 0.87	0.90	13.6	10	8	5	18	n.w.		
<i>West Central District</i>																					
Audubon (near).....	Audubon	1,297	39	19.0	+ 0.9	40	12	-18	30	37	2.44	+ 1.59	0.75	23.4	11	11	4	16	sw.	George Kibby	
Carroll.....	Carroll	1,265	46	18.4	+ 0.9	40	19	-16	30	37	2.15	+ 1.40	0.72	15.0	9	15	0	16	n.w.	Mrs. J. J. Wolfe	
Denison.....	Crawford	1,200	48	19.1	+ 1.6	41	19	-15	30	33	2.74	+ 2.03	0.95	26.5	8	12	2	17	n.w.	J. McMinimee	
Guthrie Center.....	Guthrie	1,028	37	21.5	+ 2.6	42	20	-12	30	33	2.62	+ 1.77	1.25	23.5	7	13	3	15	n.w.	Kenneth Hoyt	
Harlan.....	Shelby	1,210	40	19.0	+ 0.9	41	19†	-18	30	35	2.83	+ 2.13	1.00	25.1	9	9	6	16	n.w.	Elmer Buss	
Jefferson.....	Greene	1,052	40	20.0	+ 2.3	41	19	-13	30	36	2.83	+ 1.94	1.25	22.0	6	10	6	15	sw.	W. I. Lyon	
Little Sioux.....	Harrison	1,040	31	18.0	+ 1.2	42	19	-22	30	34	2.79	+ 2.11	0.97	26.2	10	9	9	13	sw.	H. W. Kerr	
Logan.....	Harrison	1,120	66	19.1	+ 0.7	42	19	-18	30	34	2.25	+ 1.29	0.73	21.2	9	7	15	9	sw.	Amy Ann Stern	
Onawa.....	Monona	1,051	47								2.10	+ 1.23	0.57	23.0	6	9	1	21	n.e.	Mrs. H. E. Colby	
Rockwell City.....	Calhoun	1,232	45	17.6	+ 1.4	39	25	-18	30	40	2.80	+ 1.51	1.30	25.0	7	12	5	14	n.w.	A. W. McIsaac	
Sac City.....	Sac	1,209	63	18.6	+ 2.6	43	19	-16	30	33	2.17	+ 1.19	0.90	23.0	5	10	4	17	n.w.	F. P. Kessler	
Sioux City.....	Woodbury	1,135	57	17.0	+ 0.8	39	12	-12	30	28	1.91	+ 1.17	0.59	21.9	9	6	4	17	n.w.	U. S. Weather Bureau	
Means and extremes.....				18.8	+ 0.8	43	19	-22	30	40	2.47	+ 1.64	1.30	23.2	8	10	5	16	n.w.		
<i>Central District</i>																					
Ames.....	Story	926	56	20.4	+ 2.3	41	25	-14	9	33	2.11	+ 1.27	1.01	13.1	8	7	9	15	n.w.	Chas. N. Brown	
Baxter.....	Jasper	993	33	24.0	+ 5.4	49	25	-9	9†	32	2.19	+ 1.36	1.15	11.6	7	6	8	17	w.	Geo. R. Geise	
Boone (near).....	Boone	894	48	21.4	+ 3.8	43	25	-14	9	34	2.28	+ 1.41	0.86	21.0	9	8	11	12	n.w.	Carl Fritz Henning	
Des Moines.....	Polk	861	55	24.5	+ 4.4	51	20	-8	30	37	1.83	+ 0.76	0.86	11.2	10	7	6	18	n.w.	U. S. Weather Bureau	
Fort Dodge.....	Webster	1,114	44	18.5	+ 2.9	41	12†	-15	30	37											

Climatological Data for January, 1932—Continued

STATIONS	COUNTIES	Elevation, feet	Length of record, years	Temperatures, in Degrees Fahrenheit						Precipitation, in inches				Number of Days			Prevailing direction of wind	OBSERVERS		
				Mean	Departure from normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from normal	Greatest in 24 hours	Total snowfall (unmelted)	Precipitation, .01 in. or more	Clear			Partly cloudy	Cloudy
<i>East Central District</i>																				
Belle Plaine.....	Benton .....	866	56	21.8	+ 5.7	45	19	- 8	30	30	1.86	+ 0.47	0.86	5.4	14	7	4	20	nw.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Prof. J. F. Reilly
Cedar Rapids.....	Linn .....	737	50	25.8	+ 6.8	46	25	- 8	30	31	1.28	+ 0.10	0.56	2.5	9	8	0	23	nw.	
Clinton.....	Clinton .....	595	61	29.4	+ 8.3	53	28	- 5	30	30	1.16	- 0.51	0.33	0.9	10	9	4	18	s.	
Davenport.....	Scott .....	580	61	30.0	+ 8.2	56	28	- 4	30	32	1.05	- 0.37	0.47	0.8	8	8	2	21	w.	
Iowa City.....	Johnson .....	733	75	27.7	+ 7.5	47	25	- 6	30	28	1.39	- 0.14	0.60	0.5	10	8	7	16	w.	
La Claire.....	Scott .....	576	55								1.79	+ 0.32	0.62	2.0	11					Margaret T. Disney William Strodhoff John Molis Mrs. L. Stingley John Kroepfen
Maquoketa (near).....	Jackson .....	692	39	27.0	+ 8.1	46	13†	- 6	30†	33	1.06	- 0.22	0.32	0.6	8	9	7	15	w.	
Muscataine.....	Muscataine .....	546	86								1.78	- 0.01	0.55	1.0	11					
Olin.....	Jones .....	750	34	27.5	+ 8.9	47	28	- 6	30	30	0.85	- 0.49	0.52	1.0	5	9	0	22	sw.	
Tipton (near).....	Cedar .....	806	40	28.2	+ 8.5	49	28	- 6	30	30	0.67	- 0.68	0.35	0.5	5	6	7	18	w.	
Williamsburg.....	Iowa .....	805	16	26.2	+ 6.2	49	28	- 8	30	31	0.60	- 0.70	0.22	1.2	7	11	11	9	nw.	Dr. F. C. Schadt
Means and extremes.....				27.4	+ 7.6	56	28	- 8	30	33	1.23	- 0.20	0.86	1.5	9	8	5	18	w.	
<i>Southwest District</i>																				
Atlantic.....	Cass .....	1,110	45	20.8	+ 1.8	42	20	-13	9†	38	2.57	+ 1.68	1.24	18.6	8	8	7	16	sw.	Roy L. Fancolly Arthur L. Bishop Dr. H. C. Hawley W. J. Wagner Carl E. Pollock
Bedford.....	Taylor .....	1,200	28								1.20	+ 0.20	0.75	8.0	6	6	9	16	nw.	
Clarinda.....	Page .....	1,009	60	23.8	+ 2.0	48	19	-11	9	35	1.06	- 0.15	0.61	12.0	5	9	11	11	sw.	
Corning.....	Adams .....	1,294	44	23.0	+ 2.8	48	20	-10	9†	33	1.48	+ 0.57	0.80	10.5	5	8	6	17	sw.	
Cumberland (near).....	Cass .....	1,225	33								2.37	+ 1.65	1.34	17.0	6	10	5	16	nw.	
Glenwood.....	Mills .....	1,100	42	21.2	- 0.3	46	20	-12	30	32	2.37	+ 1.69	1.12	19.2	6	7	11	13	nw.	Dr. George Mogridge P. C. Cornell J. L. Hurley W. S. Matthews B. R. Bridge
Greenfield.....	Adair .....	1,368	36								2.04	+ 1.13	0.85	12.2	6	7	12	12	nw.	
Lenox.....	Taylor .....	1,250	37	24.4	+ 3.4	47	26	-10	9	32	1.02	+ 0.31	0.65	9.2	6	10	8	13	nw.	
Oakland.....	Pottawattamie .....	1,139	19	20.9	+ 1.0	43	19	-15	30	35	2.10	+ 1.30	1.30	27.5	4	12	3	16	nw.	
Red Oak (near).....	Montgomery .....	1,030	25								1.86					8	11	12	nw.	
Riverton (near).....	Fremont .....	920	6								1.70	+ 0.95	1.01	19.4	6	5	8	18	nw.	George C. Rader H. H. Askew U. S. Weather Bureau
Thurman.....	Fremont .....	960	45	22.6	+ 1.3	48	20	-14	9	38	2.21	+ 1.50	1.40	14.5	4	5	7	19	s.	
Omaha, Neb.....	Fremont .....	1,105	67	21.2	- 0.7	43	19	- 9	30	27	2.80	+ 2.10	1.06	25.4	9	8	4	19	nw.	
Means and extremes.....				22.2	+ 1.4	48	19†	-15	30	38	1.91	+ 1.11	1.40	16.1	6	8	8	15	nw.	
<i>South Central District</i>																				
Afton.....	Union .....	1,212	51	24.2	+ 3.4	52	20	- 9	9	32	1.38	+ 0.53	0.72	10.0	6	11	4	16	nw.	S. R. Brown J. M. Stevenson Thos. Wood, Jr. C. C. Burr J. C. Davis
Albia.....	Monroe .....	949	41	28.4	+ 6.7	53	20	- 6	30	28	1.39	+ 0.32	0.54	6.7	6	8	4	19	nw.	
Centerville.....	Appanoose .....	1,013	39	29.4	+ 7.1	52	20	- 5	30	27	1.32	+ 0.30	0.70	3.4	8	12	5	14	sw.	
Chariton (near).....	Lucas .....	1,042	38	27.0	+ 5.9	50	20	- 6	30	26	0.77	- 0.16	0.22	3.0	5	12	3	16	nw.	
Corydon (near).....	Wayne .....	1,050	48	27.2	+ 5.6	52	20	- 6	30	28	1.07	- 0.09	0.55	2.3	6	12	4	15	nw.	
Creston.....	Union .....	1,293	31	22.8	+ 3.0	48	20	-15	9	34	1.10	+ 0.22	0.53	8.5	9	9	6	16	nw.	Mrs. N. Spangler Seth F. Shenton W. J. Casey J. B. Alter F. S. Parks
Indianola.....	Warren .....	972	51	25.8	+ 5.6	53	20	- 9	9	32	2.29	+ 1.18	0.76	12.0	10	11	6	14	nw.	
Knoxville.....	Marion .....	920	42	27.0	+ 6.5	52	20	- 7	30	29	1.37	+ 0.27	0.65	10.5	10	10	6	15	nw.	
Lacona.....	Warren .....	824	33								1.63	+ 0.08	0.40	11.0	10	8	12	11	nw.	
Lamoni.....	Decatur .....	1,123	28	25.9	+ 4.8	54	20	- 8	30	29	1.14	+ 0.16	0.52	2.9	7	16	3	12	nw.	
Melrose.....	Monroe .....	871	2								0.42	- 0.63	0.21	0.5	5	10	8	13	sw.	J. M. Carr E. O. Gleason James A. Verploegh D. M. Coleman H. S. Ely
Mt. Ayr.....	Ringgold .....	1,220	40	25.9	+ 4.5	52	20	- 7	9†	29	1.61	+ 0.61	0.70	11.0	5	14	2	15	nw.	
Tingley.....	Ringgold .....	1,275	8	24.5	+ 3.5	51	20	- 9	9†	29	1.60	+ 0.65	0.62	6.5	10	13	4	14	nw.	
Tracy.....	Marion .....	725									0.98		0.59	1.5	4				nw.	
Winterset.....	Madison .....	1,118	41	24.4	+ 4.0	53	20	- 9	30	29	1.44	+ 0.54	0.70	13.0	6	11	6	14	nw.	
Means and extremes.....				26.0	+ 5.0	54	20	-15	9	34	1.30	+ 0.26	0.76	6.9	7	11	5	15	nw.	
<i>Southeast District</i>																				
Bonaparte (near).....	Van Buren .....	563	45	30.4	+ 8.3	51	21	- 3	30	28	0.87	- 0.54	0.51	0.5	8	13	0	18	nw.	B. R. Vale John W. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau
Burlington.....	Des Moines .....	544	42	31.7	+ 7.8	57	28	- 2	30	38	1.22	- 0.57	0.50	3.0	10	9	4	18	nw.	
Columbus Junction.....	Louisa .....	595	41	29.5	+ 7.5	55	28	- 4	30	28	0.77	- 0.54	0.37	2.4	7	10	4	17	nw.	
Fairfield.....	Jefferson .....	780	52	28.9	+ 7.7	52	20†	- 5	30	29	1.18	- 0.23	0.52	4.5	11	6	8	17	s.	
Keokuk.....	Lee .....	614	61	32.7	+ 7.8	61	28†	- 1	30	30	1.28	- 0.28	0.46	1.7	9	6	1	24	sw.	
Keokuk No. 2.....	Lee .....	651	3	32.5	+ 8.1	60	28	- 2	30	36	1.43	- 0.27	0.51	2.4	8					J. N. D. Dickinson Dr. J. W. Rinabarger J. H. Jericho R. R. Robinson C. L. Mikesch
Keosauqua.....	Van Buren .....	639	45	30.4	+ 8.4	52	21†	- 2	30	31	0.93	- 0.48	0.45	1.0	5	8	9	14	nw.	
Mt. Pleasant.....	Henry .....	730	56	30.8	+ 8.0	57	28	- 4	30	32	1.03	- 0.38	0.50	1.5	10	7	7	17	nw.	
Oskaloosa.....	Mahaska .....	835	56	27.4	+ 6.8	52	20	- 7	30	29	1.96	+ 0.92	0.73	6.9	14	7	5	19	nw.	
Ottumwa.....	Wapello .....	649	45	29.6	+ 7.6	54	20	- 4	30	26	1.29	- 0.01	0.60	1.6	12	7	7	17	nw.	
Sigourney.....	Keokuk .....	785	37	27.2	+ 6.9	51	20	- 8	30	31	1.58	+ 0.37	0.70	1.4	5	9	7	15	e.	John B. Slate C. L. Beswick D. D. Sherman
Stockport (near).....	Van Buren .....	747	31	30.0	+ 8.6	55	28	- 4	30	30	1.06	- 0.29	0.57	2.0	9	11	2	18	nw.	
Washington.....	Washington .....	757	57	29.0	+ 7.8	52	20	- 6	30	31	1.38	+ 0.01	0.56	1.5	10	8	2	21	nw.	
Means and extremes.....				30.0	+ 7.7	61	28	- 8	30	36	1.23	- 0.20	0.73	2.3	9	8	5	18	nw.	
State means and extremes.....				22.5	+ 4.2	61	28	-22	30†	47	1.81	+ 0.78	1.40	13.6	8	9	6	16	nw.	

Temperature normals are based on the inter-station relationships during the 10-year period ending December 31, 1930, harmonized with the normals for the 46-year period, July 3, 1875 to July 2, 1921. Precipitation normals are based on the 50-year period, ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1930 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example b represents two days, etc.

T. Precipitation is less than 0.005 inch rain or melted snow.

†† Received too late to be included in means and summaries.

† Also other dates.

The average number of days with the maximum temperature 32° or below was 16, ranging from 24 days in the northwest district to 8 days in the southeast district. The average number of days with minimum temperature 32° or below was 30, ranging from 31 days in the northwest, north central and west central districts to 27 days in the southeast district. The average number of days with the minimum temperature 0° or below was 4, ranging from 7 days in the northwest district to 2 days in the east central and southeast districts.

For individual stations the number of days with the maximum

temperature 32° or below ranged from 27 days at Sioux Center to 5 days at Keokuk No. 2. The number of days with the minimum temperature 32° or below ranged from 31 days at 47 stations to 21 days at Keokuk. The number of days with the minimum temperature 0° or below ranged from 9 days at Rock Rapids to 1 day at 7 stations. The greatest daily range in temperature at any one station was 47° at Pocahontas on the 29th.

PRECIPITATION

The average precipitation for the State, derived from the averages of 9 districts of nearly equal area, and based on the records

Daily Precipitation for January, 1932

Stations	Drainage Basin	Day of Month																															Totals	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
<i>Northwest District</i>																																		
Akron	Big Sioux	.19			.40										.17	.08	.33										.09			.18			1.44	
Alta	Raccoon			.04	1.22	T.	T.							.35	T.	.67	T.										.45			.11			2.84	
Alton	Floyd	.30			.50	.10	T.						T.	.30	.20	.40	.20										.20			.20			2.40	
Cherokee	Little Sioux	.26			.46	.03	T.	T.		T.				.36	.03	.30	.03						T.				.31			.02			1.80	
Estherville	Des Moines	.50	T.		.30	.20									.30	.30										.05	.10			.08			1.83	
Hawarden	Big Sioux	.17			.23	.04	T.								.16	.09	.37	T.									.12		.09	T.			1.27	
Inwood (near)	Big Sioux	.03			.41									T.	.11	.09	.32	.08					T.	T.					.16				1.23	
Lake Park (near)	Little Sioux				.45	T.									.09	.24	.18	.08									.05						1.09	
Le Mars	Floyd	.30			.80	T.								T.	.30	.15	.70	.15									.35			T.	.08			2.83
Marathon	Raccoon	.41			.89	.19	.01								.38	.05	.54	.07									.43			.14			3.14	
Pocahontas	Des Moines	.15			.70	.20	.01	T.					T.		.35	.08	.30										.40			.07			2.26	
Rock Rapids	Big Sioux	.08			.26	.05									.06	.10	.35	.15									T.			.15			1.20	
Sanborn	Floyd	.40			.50					T.					.05	.40	.60										.10			.15			2.20	
Sheldon	Floyd	.22			.01	.52	.04	T.		T.				T.	.22	.10	.74	T.									.10			T.	.10		2.05	
Sioux Center	Floyd	.20			.50	.05	T.		T.					T.	.10	.10	.55	T.									.12			.14	T.		1.76	
Spencer	Little Sioux	.25			.75	.22									.20	.17	.30	.16									.20			.15			2.40	
Storm Lake	Raccoon	.24			.96	.32	T.							T.	.50		.52						T.	T.			.70			.16			3.40	
Washta	Little Sioux	.40			1.00	T.	T.								.50		.40										.42			.07			2.79	
West Bend	Des Moines	.28			.55	.05	T.								.22	.08	.18	.14									.39						1.89	
<i>North Central District</i>																																		
Algona	Des Moines	.20			.04	.65	.08		T.					.01	.01	.30	.10	.16	.04								.35			.04			1.96	
Allison (near)	Cedar		T.		1.01		T.	T.							.15	.24	.05	.01									.05	.03		.10			1.66	
Belmond	Iowa	.20			.60							.02		T.	.01	.08	.18	.15									.35			.05			1.64	
Britt	Iowa	.71			.51	.46									.30	.12	.15	.31									.32			.09			3.01	
Charles City***	Cedar	.03	.02		.06	.82	.01	T.	T.	T.			.03	.40		.31	.38										.26			.08			2.37	
Forest City	Cedar	.10	.05		.05	.55	.26	.05	.02					.03	.25	.15	.20	.30									.38			.15			2.54	
Hampton	Cedar				.63				T.	T.				.15	.25	.33											.15						1.51	
Humboldt	Des Moines	.02			.60	.06	T.			T.					T.	.02	.02										.40			T.			1.06	
Mason City	Cedar	.05	T.		.65	.06	T.	T.	T.	T.			.02	.03	.14	.14	.30	.10					T.	T.	T.		.25	T.		.03			1.77	
Northwood	Cedar	.10	T.		.05	.70	.15							T.	.02	.40	.20	.10	.30								.40			.10			2.52	
Osage	Cedar	.05			.81		.10	.05						.05	.20	.15		.30										.30			.10			2.11
<i>Northeast District</i>																																		
Cedar Falls	Cedar	.22	T.		.90	.07	T.	.01	T.			.01	.28	.06	.38	.11	.03	.20									.23	.04		.01			2.55	
Decorah	Mississippi	.30			.80									.24	.24	.20	.52	.15	.15				T.				.12	.13		T.			2.70	
Delaware (near)	Maquoketa				.53				T.					.14	.08	.06		.04	.15	T.							.19			T.			1.19	
Dubuque***	Mississippi	T.	T.		.04	.38	T.	T.	T.	T.				.16	T.	.23		.16	.02								.20			T.			1.21	
Fayette	Mississippi	T.			.77	T.	.06	T.	T.					.22	.07	.32	.06	T.	.19								.15	.02		.01			1.94	
Independence	Wapsipinicon	.45			.64	T.		.01	T.					.20	.16	.22	.05	.01	.14								.25			.01			2.14	
Lansing	Mississippi																																	
New Hampton	Wapsipinicon																																	
Oelwein	Wapsipinicon	.20			.61									.20	.50	.21	.32										.32						2.51	
Postville (near)	Mississippi	.05			.50			T.				.05		.20	.16	.30		.10	.05							.10			.03			1.54		
Waterloo	Cedar	.10			.75	.10	T.	T.					.01	.10	.50	.10	.20										.20	.02		.02			2.10	
Waverly	Cedar	.34			.87		.03	.02	T.		T.			.09	.58	.14	.10																2.17	
<i>West Central District</i>																																		
Audubon (near)	Nishnabotna	.15			.75	.25	T.					.02		.55	.10	.10	.05										.35			.02		.10	2.44	
Carroll	Raccoon				.72	.20						.05		.30	.26	.32	.10										.15			.05			2.15	
Denison	Missouri	.10			.95	.14	T.							.47	.09	.57	T.										.40			.02		T.	2.74	
Guthrie Center	Raccoon	.15			1.25										.50	.10	T.	.25									.30			T.		.07	2.62	
Harlan	Nishnabotna	.05	T.	T.	1.00	.13	T.	T.		T.		.03	T.	T.	.61	.13	.43	.08									.37			T.		T.	2.83	
Jefferson	Raccoon	T.	T.		1.25	T.	T.					.05			.60	.54	T.										.34			.05	T.		2.83	
Little Sioux	Little Sioux	.05			.08	.97	.03	T.						T.	.69	.48											.43			.03		.01	2.79	
Logan	Missouri	.03			.73	.02	T.					.04		T.	.46	.07	.40										.45			.05		T.	2.25	
Onawa	Missouri				.50		T.							.19	.48		.48										.57			T.	.18		2.10	
Rockwell City	Raccoon	.20			1.30	.10									.40		.30										.40			.10			2.80	
Sac City	Raccoon				.90		T.			T.			T.		.50		.44										.28			.05			2.17	
Sioux City***	Missouri	.06	T.		.05	.59	T.	T.					T.	T.	.38		.49										.26			.03	.04		1.91	
<i>Central District</i>																																		
Ames	Skunk	T.			1.01	.03	T.	T.					.07	T.	.37	.12	.07	.12									.32	T.		T.			2.11	
Baxter	Skunk	.13			1.15		T.	T.						.24	.31		.14										.19	.03		T.			2.19	
Boone (near)	Des Moines	.19			.86	.06	T.	T.						.05	.36	.12	.25	T.									.35			.01			2.28	
Des Moines***	Des Moines	.01	T.		.18	.71	.01	T.	T.					.12	.38		.20										.18			T.		.02	1.83	
Fort Dodge	Des Moines				.02	.93	.14				.12	.01		.04	.40	.07	.31	.12									.41			.05			2.62	
Grinnell	Iowa	.04			.54	T.								.15	.20	.13	.08	.02	.15								.15	T.		T.			1.48	
Grundy Center	Cedar	T.	T.		1.00		T.	.10	T.			.50		.38	.37		T.										.30	.10					2.75	
Iowa Falls	Iowa	.30			.60	.30								.25	.25	.30	.15	.10	.10								.30			.05			2.80	
Marshalltown	Iowa	T.			.50	.03		.01	T.					.16	T.	.25	T.	T.	.05								.20	T.		T.			1.20	
Monroe	Des Moines				.72	.20	T.	T.	T.					.11	.04	.27		.05																

Daily Precipitation for January, 1932—Continued

Stations	Drainage Basin	Day of Month																															Totals					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
<i>Southwest District</i>																																						
Atlantic	Nishnabotna	T.			.12	1.24	T.	T.				.02				.46	.04	.22	T.														.46	T.	.01	2.57		
Bedford	102	.10			.10	.75	T.					.05						.10	T.														.10		1.20			
Clarinda	Nodaway				.20	.61												.05	.10														.10		1.06			
Corning	Nodaway	0.10			.08	.80		.25					T.		T.																	.25		T.	1.48			
Cumberland (near)	Nodaway	.10			T.	1.34	T.	T.				T.	T.			.40	T.	.12	.02													.39		T.	2.37			
Glenwood	Missouri	.05			.02	1.12						T.				.30		.48														.40		T.	2.37			
Greenfield	Nodaway				.35	.85		T.				T.				.25		.25														.32		T.	2.04			
Lenox	Missouri				.20	.65										.03	.03	T.														.08		T.	1.02			
Oakland	Nishnabotna	T.			T.	1.30	T.					T.				.42		.25	T.													.13		T.	2.10			
Red Oak (near)	Nishnabotna				.20	.96										.20		.10														.40			1.86			
Riverton (near)	Nishnabotna	.03			.11	1.01		T.				T.				.10		.25														.20		T.	1.70			
Thurman	Missouri				T.	1.40										T.	.17	.37														.27		T.	2.21			
Omaha, Neb.***	Missouri	.02		T.	.14	1.04		T.				T.				T.	.65	.45					T.	T.	T.						.46		T.	2.80				
<i>South Central District</i>																																						
Afton	Grand				.22	.72										.02		.21														.05		T.	1.38			
Albia	Des Moines	.10		T.	.54	T.										.13		.40	T.	.10												.12		T.	1.39			
Centerville	Chariton	.03			.70	T.										.21	.04	.18		.14			.01	T.								.01		T.	1.32			
Chariton (near)	Chariton	T.			T.	.19	.12		T.	T.						.22																.14			.10	0.77		
Corydon (near)	Chariton				.09	.55												.20		.11												.11			.01	1.07		
Creston	Missouri	.02			.13	.53	T.	T.								.04		.21	.01	.06	.04											.06		T.	1.10			
Indianola	Des Moines	.05			.10	.76	.20									.11		.36	T.	.14	.40											.11	T.	.05	2.29			
Knoxville	Des Moines	.05			.05	.65										.12	.05	.05	.10				T.									.15			.10	1.37		
Lacona	Des Moines				.10	.40	.10									.15	.20	.20	.12													.20		.06	.10	1.63		
Lamoni	Grand				.21	.52										.11		.13	T.	.07	.06											.04		T.	1.14			
Melrose	Des Moines	T.			T.	.21										.07	.05	T.		.05												T.		T.	.04	0.42		
Mt. Ayr	Grand				.40	.70										.13		.26		.12																1.61		
Tingley	Platte	T.			.22	.62	.05									.18	.03	.18	.04	.12	.04											.12		T.	1.60			
Tracy	Des Moines				.59	.70			T.							.14		T.	.11				T.									.14		T.	.98			
Winterset	Des Moines				.20	.70										.05		.10	.34													.05		T.	1.44			
<i>Southeast District</i>																																						
Bonaparte (near)	Des Moines				T.	.51		T.								T.	.12	.09	.02	.01	.02											.05		T.	.05	T.	0.87	
Burlington	Mississippi	T.			T.	.50		T.								.11	T.	.17	.06	.04	.01											.08		.09	.11	T.	.05	1.22
Columbus Junction	Iowa	T.			.02	.37			.01	.01						T.		.15	.05	T.													.16		T.	.07	0.77	
Fairfield	Skunk	T.			.09	.52			.03							.15		.07	.12	.07	.02												.07		T.	.02	1.18	
Keokuk***	Mississippi	T.	T.		.08	.38			T.							.10		.30		.09			.01	T.		.12						.09		T.		1.28		
Keokuk No. 2	Mississippi	T.			.03	.51		T.								T.		.35	.08	.10												.15		.10		T.	1.43	
Keosauqua	Des Moines				.08	.45		T.								.25		T.		.05	.10											.10		T.	.03	0.93		
Mt. Pleasant	Skunk				.02	.50		T.								.02	.08	.10	.15	.03												.09		T.	.02	1.03		
Oskaloosa	Des Moines	.11	T.		.03	.73	.08		.02							.24	.08	.14	.12	.08	.15											.12		T.	.05	1.96		
Ottumwa	Des Moines	.02	T.		.05	.60			.01							.12	.13	.14	.01	.02	.07											.09		T.	.03	1.29		
Sigourney	Skunk	T.			T.	.59			.02							.15		.70		T.												.12		T.		1.58		
Stockport (near)	Skunk	.03			T.	.57	.03		.04							.10	T.	.12	T.	.04	.06											.07		T.		1.06		
Washington	Skunk	.13			.02	.56		.02								.18		.02	T.	.08	.22											.12		T.		1.38		

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

||| Precipitation measured in the morning; amount then recorded is for the preceding 24 hours.

\*\*\* Regular Weather Bureau Station: precipitation is for 24-hour period midnight to midnight.

\*\* Incomplete.

\* Precipitation included in the next following measurement.

T. Precipitation is less than 0.005 inch rain or melted snow.

i. Interpolated.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

Stations	Barometric Pressure, Inches (Sea Level)				Relative Humidity, %				Wind				Sunshine				
	Mean	Highest	Date	Lowest	Date	Mean		Lowest	Date	Total movement	Average hourly velocity	Maximum					
						7 A. M.	12 Noon					Miles		From			
Chas. City	30.08	30.87	31	29.38	12	88	77	84	45	31	5,680	7.6	20	nw.	20	37	-13
Davenport	30.09	30.80	31	29.42	12	82	70	75	40	27	8,508	11.4	30	sw.	19	29	-19
Des Moines	30.09	30.83	31	29.34	15	88	76	80	46	25	7,193	9.7	25	nw.	29	41	-14
Dubuque	30.07	30.84	31	29.42	12	87	77	80	40	25	5,251	7.1	20	s.	19	24	-25
Keokuk	30.11	30.81	31	29.45	12	80	66	74	37	30	6,451	8.7	24	w.	17	40	-12
Sioux City	30.10	30.85	31	29.25	12	89	82	83	48	24	8,104	10.9	34	nw.	29	47	-7
Omaha, Nb	30.12	30.89	31	29.30	12	88	80	84	53	24	6,328	8.5	25	nw.	29	40	-17
Means and extremes.	30.09					86	75	80				9.1				37	-15
Normals and records.	30.14		25th		3d	81		77		19				6th	52		
		31.09	1905	\$28.71	1906				723	1928			56	nw.	1903		

§Sioux City, \$Dubuque, ‡Local mean time, †And other dates.

‡‡True velocities obtained from corrected indicated velocities of 4-cup anemometers began January 1, 1932. See correction table elsewhere in this issue.

of 119 stations, was 1.81 inches, or 0.78 inch above normal. The greatest district excess was in the west central district, 1.64 inches, and the east central and southeast had the only district deficiency, 0.20 inch. The greatest precipitation excess at any one station was 2.76 inches at Storm Lake, and Tipton (near) had the greatest de-

fiency, 0.68 inch. The greatest amount at a single station was 3.40 inches at Storm Lake and the least was 0.42 inch at Melrose. The greatest amount in 24 consecutive hours was 1.40 inches at Thurman on the 5th.

The average number of days with 0.01 inch or more of precipitation for the State was 8, ranging from 10 days in the north central and northeast districts, to 7 days in the south central district. For individual stations, the range was from 14 days at Forest City, Cedar Falls, Belle Plaine and Oskaloosa to 4 days at Oakland, Thurman and Tracy.

SNOWFALL

The average snowfall for the State was 13.6 inches, or 6.8 inches above normal. All of the stations received measurable amounts. The greatest district average was in the northwest district, 23.8 inches, and the east central district had the least district average, 1.5 inches. The greatest total snowfall at any one station for January was 34.0 inches at Algona, and the least was 0.5 inch at Iowa City, Tipton (near), Melrose and Bonaparte (near). The greatest snowfall in 24 consecutive hours was 14.0 inches at Oakland on the 5th. The greatest number of days with 0.1 inch or more of snow on the ground was 31 days in the entire northwest half of the State. The greatest depth of snow on the ground at any time was 27.0 inches at Marathon on the 29th.

SNOW ROLLERS

"Snow rollers" formed during the night of January 26 at places in western Iowa and were observed during the day of January 27. Places from which reports were received were, Bagley, Coon Rapids, Stanhope, Laurens and numerous localities in southern and western Greene County.

They are balls or rolls of snow formed by the wind, ranging in size from eggs to small barrels. In some way the wind starts a

Daily Maximum and Minimum Temperature for the Month of January, 1932

Table with columns for Stations, days 1-31, and Mean. Rows are categorized by Northern Division, Central Division, and Southern Division, listing various Iowa cities and their daily temperature ranges.

Temperatures are for the 24-hour period ending from about sunset to 7 p. m., except where otherwise noted. \* For 24 hours, midnight to midnight.

very small mass of moist snow rolling along over the snow covered ground. The mass gains by accretion of other snow and if the wind is sufficiently strong the roll soon takes the form and reaches the size of a roll of cotton batting or a lady's muff. The ends are hollowed out and sometimes the hole extends clear through from end to end of the roll, though small at the center. This gives the hollow ends the appearance of funnels. The rolls are of such loose and fluffy texture that they fall to pieces when an attempt is made to pick them up. From the point of origin there is a distinct and widening track in the snow on the ground where snow has been gathered by the rollers. These tracks are 20 to 100 feet long. In the hilly country south of Coon Rapids some were reported as large as barrels, but for the most part, the larger ones were somewhat smaller than barrels. In the vicinity of Coon Rapids these made "many pastures and fields look as if a host of fairies had rolled thousands of big snow balls during the night". Near Laurens "the balls piled up in places so that a man could not walk among them".

In most of the area where these snow rollers formed, there was at sunset of January 25th a hard crust or deposit of old snow ranging from 1 to 20-inches deep. Moist snow or snow and rain began falling during the night with surface temperatures slightly above the freezing point. The snow continued on the 26th till about 4 p. m. to 5 p. m. and mounted to from 2 to 4 inches. The barometric center of the storm at 7 a. m. of January 26 was between North Platte, Nebraska and Goodland, Kansas, and it moved rapidly north-eastward directly over the area where the snow rollers formed, passing between noon and 2 p. m. It was attended by moderate shifting winds mostly from the southeast, through the south to west during the early part of the night of the 26th-27th and to north-west with increasing strength during the early morning of the 27th. It was during the period of westerly wind that the rollers formed, with temperatures falling rather sharply, 17° to 23°, and reaching 1° to 15° above zero by the morning of the 27th.

This phenomenon has been observed in many of the northern States, but apparently only about once in a generation. It may escape notice in and near towns where it could be mistaken for the work of children, the absence of the childrens' tracks being unnoticed. The rollers are usually formed at night. Some excellent photographs of snow rollers at Canton, New York, were published in the Monthly Weather Review, Washington, D. C., February, 1907, p. 71; also in the same publication for July, 1906, pp. 325-326. Brief accounts are in this same publication for December, 1895, January, 1898 and March, 1899. Good photographs appeared in the *Des Moines Sunday Register*, February 14, 1932. C. D. R.

MISCELLANEOUS PHENOMENA

- Aurora*: 29th, 30th.
- Cold Waves*: 2d, 8th, 15th, 29th, 30th.
- Corona*, lunar: 16th, 18th, 19th.
- Fog*, dense: 9th, 10th, 11th, 12th, 13th, 20th, 21st, 22d, 28th.
- Fog*, light: 3d, 4th, 9th, 10th, 11th, 12th, 13th, 19th, 20th, 21st, 22d, 28th.
- Gales*: 17th, 19th, 20th.
- Glaze*: 1st, 14th, 15th, 16th, 17th.
- Graupel*: 26th.
- Halo*, lunar: 15th, 19th, 23d, 25th, 27th.
- Halo*, solar: 8th, 9th, 23d, 28th, 29th, 30th.
- Haze*: 11th, 21st.
- Hoar frost*: 8th, 22d.
- Iridescence*: 15th.
- Parhelia*: 27th, 29th, 30th.
- Sleet*: 1st, 4th, 5th, 12th, 14th, 15th, 16th, 17th, 26th.
- Snow*: 1st, 2d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 13th, 14th, 15th, 16th, 17th, 21st, 23d, 26th, 28th, 29th, 31st.
- Snow rollers*: 26th, 27th.

RETURN TO 4-CUP ANEMOMETER

From January 1, 1928 to December 31, 1931, 3-cup anemometers were used at first order Weather Bureau stations. After these four years of experience and further careful tests it was deemed best to return to the 4-cup anemometers, which was done beginning January 1, 1932.

Hereafter the wind movement and maximum velocities published will be the indicated velocities of the 4-cup anemometer, corrected to true velocities by the use of the following correction table.

True Wind Velocities

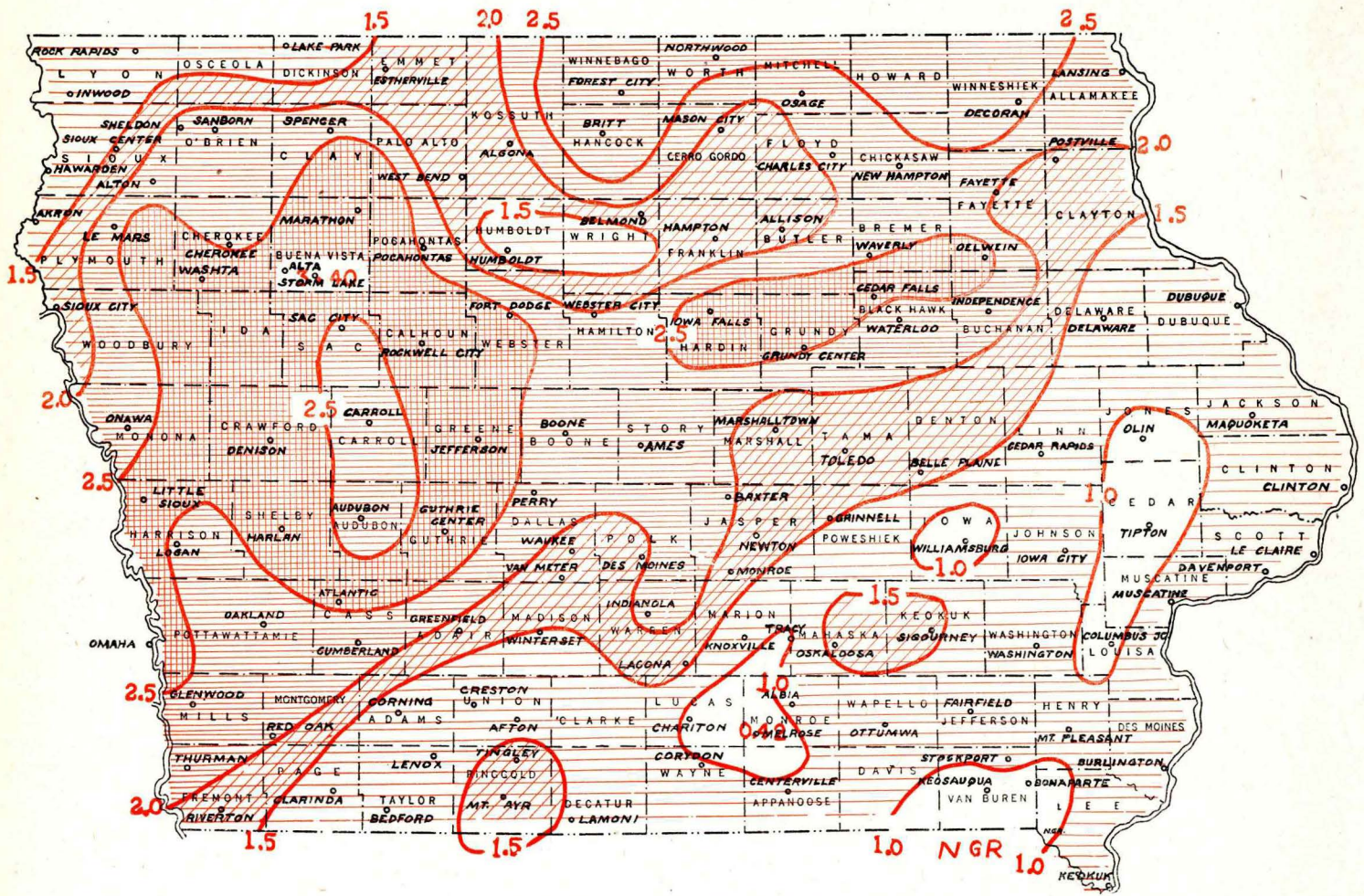
Velocities indicated by 4-cup anemometer, M. P. H.	Correction in whole miles per hour	Velocities indicated by 4-cup anemometer, M. P. H.	Correction in whole miles per hour
0 to 8	+ 1	78 to 80	-18
9 to 12	0	81 to 84	-19
13 to 16	- 1	85 to 88	-20
17 to 20	- 2	89 to 91	-21
21 to 24	- 3	92 to 95	-22
25 to 28	- 4	96 to 99	-23
29 to 32	- 5	100 to 103	-24
33 to 36	- 6	104 to 106	-25
37 to 39	- 7	107 to 110	-26
40 to 43	- 8	111 to 114	-27
44 to 47	- 9	115 to 117	-28
48 to 51	-10	118 to 121	-29
52 to 54	-11	122 to 125	-30
55 to 58	-12	126 to 128	-31
59 to 62	-13	129 to 132	-32
63 to 65	-14	133 to 136	-33
66 to 69	-15	137 to 140	-34
70 to 73	-16	141 to 143	-35
74 to 77	-17		

RIVER DATA FOR THE STATE OF IOWA, JANUARY, 1932

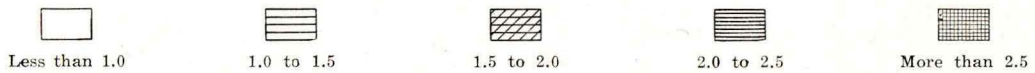
Station	River	Flood stage, feet	Average stage, feet	Monthly mean stage, feet	Departure from average, feet	Highest stage, feet	Date	Lowest stage, feet	Date
Lansing.....	Mississippi.....	18							
Dubuque.....	Mississippi.....	18	3.9	3.5	- 0.4	4.7	27	1.9	11
Clinton.....	Mississippi.....	16		4.7		6.0	31	2.4	13
Le Claire.....	Mississippi.....	10		2.2		2.6	28†	1.4	13
Davenport.....	Mississippi.....	15	4.2	3.9	- 0.3	4.4	3†	2.7	12
Muscatine.....	Mississippi.....	16		4.7		5.3	3†	3.6	12
Keokuk.....	Mississippi.....	14	2.8	5.8	+ 3.0	8.5	3	3.3	13
Cedar Rapids.....	Cedar.....	14		4.6		5.3	16	3.8	11
Wapello.....	Iowa.....	14		5.1		6.4	18	3.5	31
Boone.....	Des Moines.....	20							
Des Moines.....	Des Moines.....	17	2.0	5.7	+ 3.7	9.4	2	3.1	31
Tracy.....	Des Moines.....	15							
Ottumwa.....	Des Moines.....	10		7.1		11.5	3†	4.8	31
Van Meter.....	Raccoon.....	13		6.7		12.3	1	5.0	22†
Sioux City.....	Missouri.....	17	6.0	3.9	- 2.1	6.1	31	2.0	5
Omaha, Neb.....	Missouri.....	19	5.5	5.4	- 0.1	6.7	31	3.3	8

†And other dates.

TOTAL PRECIPITATION, JANUARY, 1932



SCALE OF SHADES IN INCHES





## NORMAL TEMPERATURE AND PRECIPITATION

Based on records ending with the year 1930. The methods used in preparing them are described on pages 11 and 12. The use of these normals began January 1, 1932.

### NORMAL TEMPERATURE, ANNUAL Degrees Fahrenheit

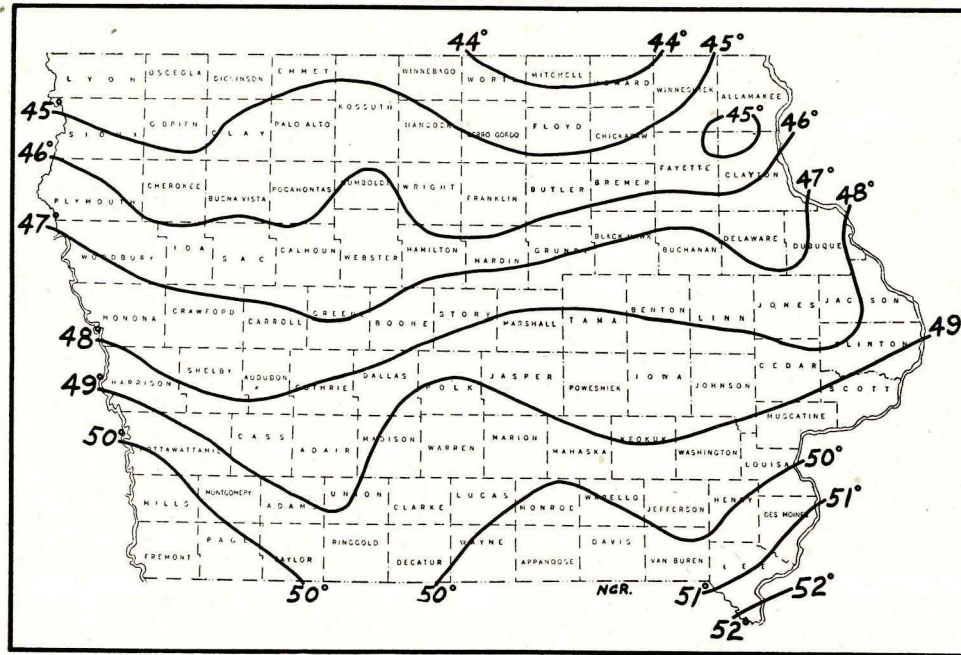


Figure 1. State average, 47.8°.

### NORMAL PRECIPITATION, ANNUAL Inches

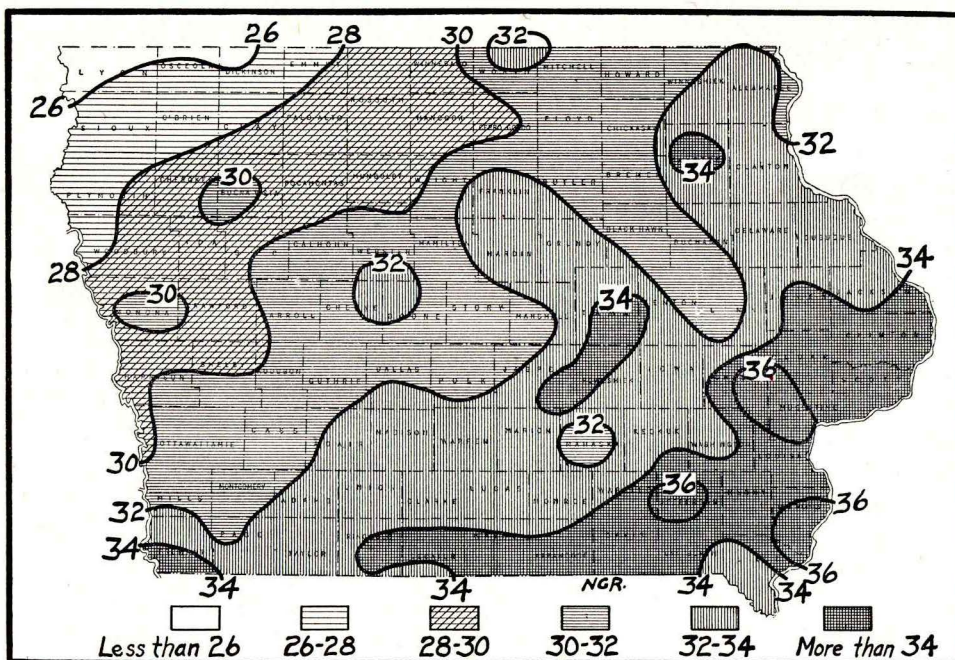


Figure 2. State average, 31.89 inches.

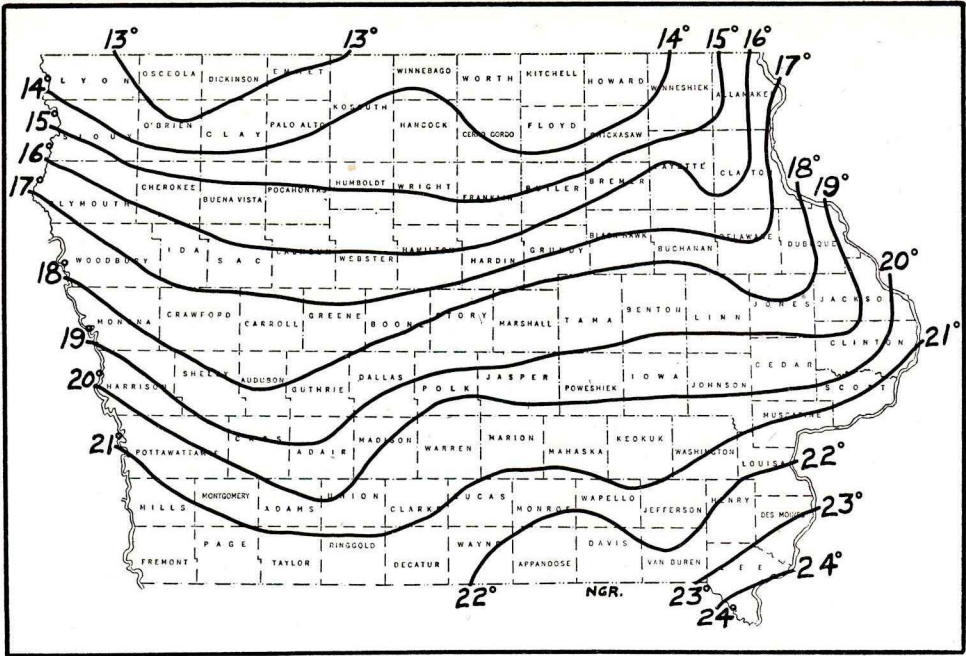


Figure 3. January normal temperature; average, 18.3°. January is usually Iowa's coldest month.

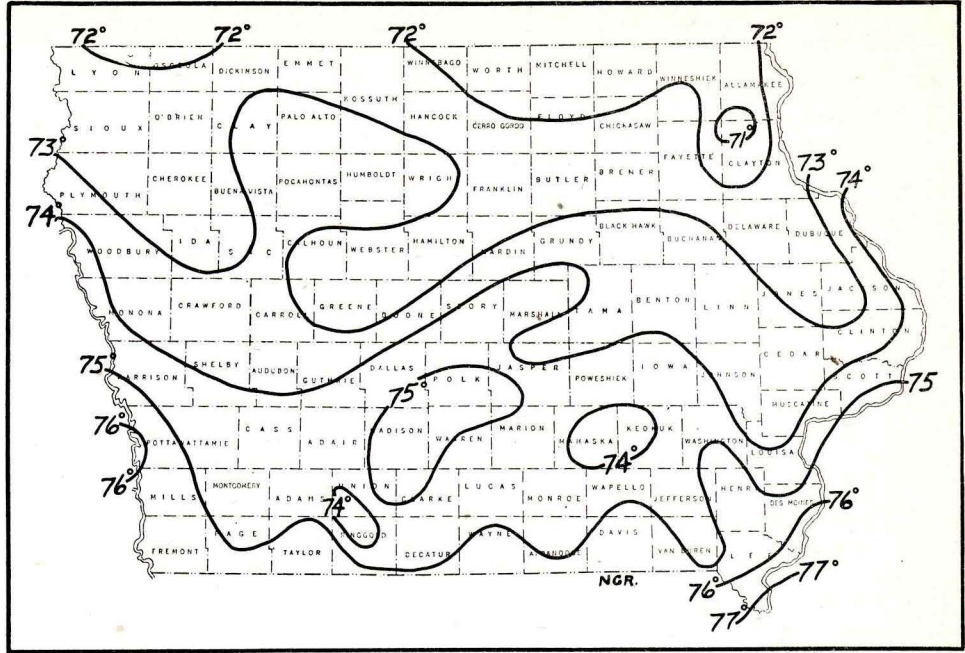


Figure 4. July normal temperature; average, 73.8°. July is usually Iowa's warmest month.

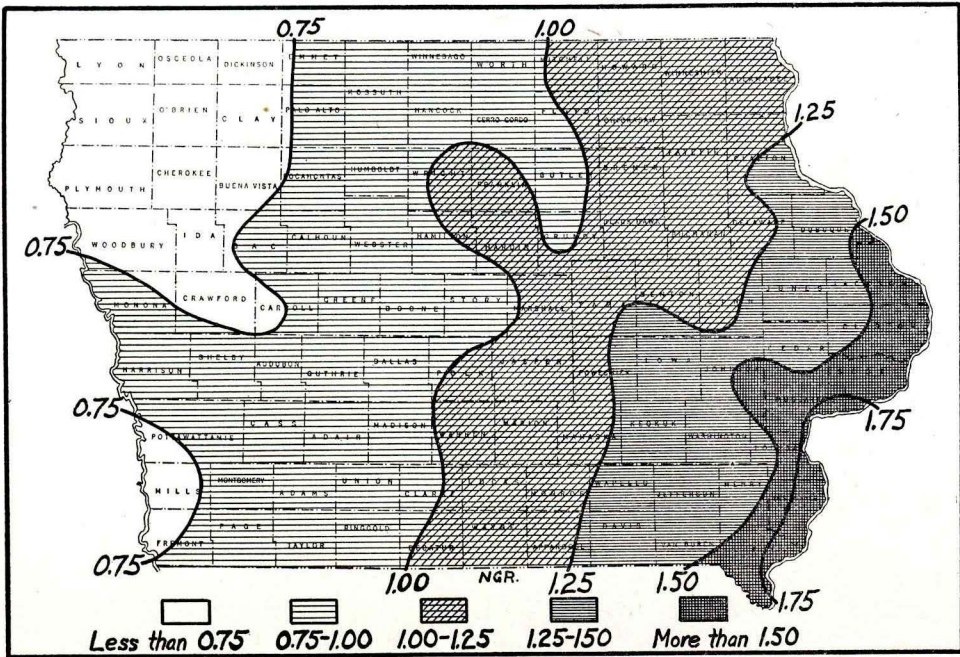


Figure 5. January normal precipitation; average, 1.03 inches. January is usually Iowa's driest month.

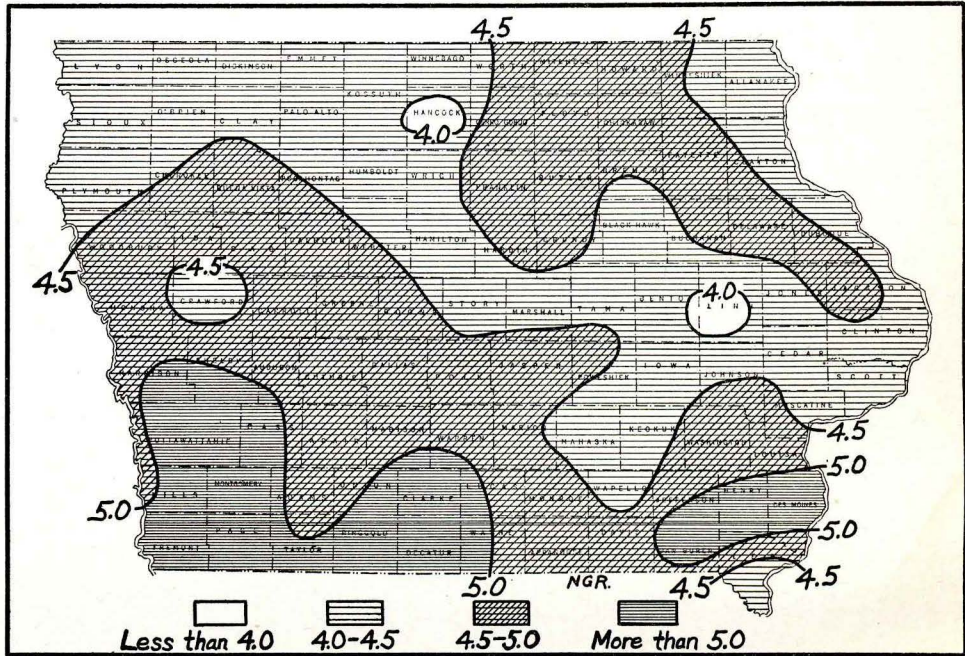


Figure 6. June normal precipitation; average, 4.58 inches. June is usually Iowa's wettest month.

**PRECIPITATION NORMALS**

Because of the wide range in precipitation data, it is obvious that normals based on short periods of record cannot be satisfactory. For that reason the normal maps on pages 8 and 9 are based on records of 40 or more years. The construction of such maps is further complicated by the general downward secular trend of precipitation. A record of 50 years ending say 20 years ago does not fit in well with other long but continuing records.

Normals for First Order Weather Bureau stations here published are based on the 50 years ended December 31, 1927; for most of the cooperative stations, on all records of 10 years or more; and on interpolations from normal maps for recently established stations or those having grossly inharmonious averages that will probably smooth out in time.

**NORTHWEST DISTRICT**

STATIONS	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Akron.....	0.60	0.86	1.25	2.75	4.00	4.50	3.90	3.00	2.50	2.05	1.10	0.75	27.26
Alta.....	0.73	1.00	1.52	3.01	4.57	4.97	3.73	3.57	3.53	2.08	1.44	0.90	31.05
Alton.....	0.74	0.89	1.17	2.28	4.12	3.64	3.13	3.18	3.14	1.59	1.26	0.78	25.92
Cherokee.....	0.60	0.80	1.15	2.65	4.40	4.50	3.75	3.30	3.50	2.00	1.35	0.80	28.80
Estherville.....	0.60	0.87	1.23	2.59	4.06	4.16	3.47	3.32	3.60	1.80	1.33	0.71	27.74
Hawarden.....	0.60	0.85	1.25	2.70	4.10	4.40	3.80	2.90	2.90	2.10	1.10	0.80	27.50
Inwood, near.....	0.64	0.76	1.14	2.29	3.74	4.78	3.14	2.83	3.00	1.74	1.17	0.71	25.84
Lake Park, near.....	0.63	0.88	1.23	2.31	3.84	3.80	2.74	3.60	3.78	1.49	1.08	0.60	25.98
Le Mars.....	0.59	0.77	1.19	2.76	4.21	4.36	3.72	2.98	3.26	1.92	1.15	0.81	27.71
Marathon.....	0.70	0.90	1.30	2.75	4.20	4.55	3.25	3.50	3.45	2.10	1.35	0.85	28.90
Pocahontas.....	0.72	1.00	1.39	2.80	3.93	4.48	3.10	3.54	3.81	2.28	1.51	0.87	29.43
Rock Rapids.....	0.68	0.67	1.30	2.78	3.73	4.39	3.17	2.62	2.64	1.81	1.16	0.65	25.60
Sanborn.....	0.74	1.00	1.25	2.89	3.96	3.99	3.17	3.42	3.66	1.47	1.34	0.80	27.69
Sheldon.....	0.81	0.78	1.38	2.72	4.13	3.93	3.98	3.28	3.27	2.16	1.22	0.77	28.43
Sioux Center.....	0.74	0.94	1.25	2.72	4.29	3.92	3.55	3.07	3.44	1.79	1.19	0.82	27.72
Spencer.....	0.66	0.91	1.21	3.17	3.64	3.52	2.55	3.38	3.75	1.57	1.36	0.83	26.55
Storm Lake.....	0.64	0.85	1.35	2.80	4.15	4.80	3.48	3.21	3.24	1.91	1.30	0.80	28.53
Washita.....	0.62	0.84	1.14	2.69	4.11	4.79	3.76	3.20	3.58	1.91	1.30	0.79	28.73
West Bend.....	0.84	0.91	1.34	2.71	3.83	4.15	3.21	3.63	3.33	1.92	1.33	1.04	28.14
Average.....	0.68	0.87	1.26	2.70	4.05	4.30	3.40	3.23	3.33	1.88	1.27	0.79	27.76

**NORTH CENTRAL DISTRICT**

STATIONS	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Algona.....	0.91	1.17	1.52	2.69	4.00	4.32	2.99	3.75	3.64	2.06	1.35	1.00	29.40
Allison, near.....	1.00	1.27	1.54	2.66	4.20	3.86	3.79	3.33	4.41	2.31	1.46	0.89	30.72
Belmond.....	1.12	1.16	1.35	3.10	4.40	4.50	3.38	3.77	4.27	2.19	1.81	1.13	32.18
Britt.....	0.75	0.83	1.25	2.38	4.20	3.94	3.23	3.47	3.83	2.07	1.34	0.85	28.14
Charles City.....	1.05	1.10	1.77	2.52	4.33	4.63	3.77	3.48	3.68	2.33	1.53	1.30	31.49
Forest City.....	0.92	0.97	1.44	2.55	4.26	4.35	3.43	3.33	3.52	2.21	1.42	0.93	29.33
Hampton.....	1.11	1.19	2.02	3.04	4.70	4.86	4.05	3.61	3.70	2.71	1.57	1.20	33.76
Humboldt.....	0.90	0.97	1.44	2.68	3.99	4.28	3.49	3.41	3.39	2.18	1.47	0.83	29.03
Mason City.....	0.92	1.01	1.44	2.72	4.16	4.62	3.21	3.84	3.31	2.00	1.36	0.97	29.56
Northwood.....	1.01	1.25	1.78	2.86	4.78	4.80	3.50	3.92	4.14	2.42	1.83	1.17	33.46
Osage.....	1.10	1.05	1.74	2.54	4.28	4.77	3.31	3.25	3.65	2.33	1.50	1.23	30.76
Average.....	0.98	1.09	1.57	2.70	4.30	4.44	3.47	3.56	3.78	2.26	1.51	1.05	30.71

**NORTHEAST DISTRICT**

STATIONS	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Cedar Falls.....	1.10	1.15	1.75	2.60	4.10	4.40	3.95	3.55	4.05	2.40	1.60	1.20	31.85
Decorah.....	1.13	1.06	1.80	2.79	4.42	4.42	4.31	3.46	4.02	2.55	1.81	1.19	32.93
Delaware, near.....	1.19	1.02	1.80	2.73	4.42	4.57	3.84	3.58	4.31	2.78	1.77	1.52	33.56
Dubuque.....	1.30	1.38	2.03	2.85	4.22	4.31	3.94	3.24	4.01	2.48	1.70	1.44	32.90
Fayette.....	1.20	1.30	2.14	3.07	4.57	4.65	3.93	3.63	3.90	2.46	1.81	1.38	34.04
Independence.....	1.14	1.18	1.77	2.52	4.16	4.63	4.18	3.59	4.12	2.65	1.57	1.36	32.87
Lansing.....	1.01	1.11	1.85	2.66	4.43	4.50	3.97	3.47	4.13	2.54	1.85	0.95	32.47
New Hampton.....	0.96	1.09	1.76	2.58	4.58	4.25	3.57	3.93	3.92	2.36	1.70	1.04	31.74
Oelwein.....	1.15	1.20	1.85	2.75	4.30	4.60	3.95	3.40	4.05	2.40	1.70	1.35	32.70
Postville, near.....	1.16	1.17	1.86	2.94	4.64	4.47	4.18	3.67	3.88	2.60	1.77	1.27	33.61
Waterloo.....	1.05	1.17	1.74	2.50	4.00	4.04	3.94	3.52	4.10	2.39	1.58	1.18	31.21
Waverly.....	1.12	1.13	1.73	2.68	4.11	4.37	3.94	3.36	3.97	2.43	1.65	1.20	31.69
Average.....	1.13	1.16	1.84	2.72	4.33	4.43	3.98	3.53	4.04	2.50	1.71	1.26	32.63

**WEST CENTRAL DISTRICT**

STATIONS	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Audubon, near.....	0.85	1.12	1.50	2.85	3.76	4.38	3.54	3.72	4.11	2.23	1.43	0.93	30.42
Carroll.....	0.75	0.99	1.55	2.78	4.14	4.77	3.48	4.05	3.89	2.30	1.29	0.94	30.93
Denison.....	0.71	0.94	1.45	2.76	4.05	4.27	3.64	3.75	3.29	2.15	1.21	0.83	29.05
Guthrie Center.....	0.85	1.11	1.55	2.90	4.11	4.48	3.86	4.00	3.93	2.47	1.41	1.01	31.68
Harlan.....	0.70	0.93	1.30	2.78	3.90	4.73	3.85	4.02	3.62	2.37	1.34	0.86	30.40
Jefferson.....	0.89	1.14	1.60	2.65	3.94	4.56	3.65	3.76	4.24	2.28	1.37	0.97	31.05
Little Sioux.....	0.68	1.04	1.29	2.54	3.91	4.43	3.60	3.50	3.14	1.93	1.45	0.80	28.31
Logan.....	0.96	1.08	1.59	2.77	4.00	5.11	4.24	3.78	3.27	2.21	1.35	1.03	31.39
Onawa.....	0.87	1.20	1.54	2.66	4.35	4.64	3.94	4.10	3.52	2.07	1.42	1.04	31.35
Rockwell City.....	0.99	1.18	1.61	2.87	4.27	4.69	3.64	3.64	3.66	2.26	1.51	0.96	31.28
Sac City.....	0.98	1.14	1.48	2.72	4.00	4.79	3.55	3.61	3.46	2.13	1.28	1.05	30.19
Sioux City.....	0.74	0.82	1.15	2.70	4.05	3.99	3.54	3.13	3.03	1.77	1.00	0.90	26.82
Average.....	0.83	1.06	1.47	2.75	4.04	4.57	3.71	3.76	3.60	2.18	1.34	0.94	30.25

**CENTRAL DISTRICT**

STATIONS	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Ames.....	0.84	0.82	1.40	2.89	4.25	4.24	3.71	3.57	3.97	2.51	1.28	1.00	30.58
Baxter.....	0.83	1.02	1.81	2.95	4.56	4.41	3.77	3.34	4.40	2.31	1.45	0.88	31.73
Boone, near.....	0.87	1.01	1.69	2.85	4.26	4.60	3.93	4.12	4.39	2.62	1.55	0.99	32.88
Des Moines.....	1.07	1.12	1.78	2.91	4.56	4.76	3.50	3.22	3.67	2.50	1.43	1.22	32.04
Fort Dodge.....	0.76	0.85	1.64	2.64	3.98	4.50	4.22	3.91	4.27	2.70	1.47	0.97	31.91
Grinnell.....	1.06	1.15	1.84	3.40	4.56	4.84	4.20	3.68	4.21	2.68	1.74	1.07	34.43
Grundy Center.....	0.96	0.96	1.77	3.12	4.54	4.72	3.68	3.82	4.03	2.63	1.52	1.11	32.86
Iowa Falls.....	1.16	1.60	1.83	3.07	4.33	4.98	3.75	3.89	3.96	2.39	1.64	1.25	33.85
Marshalltown.....	1.08	1.12	1.87	2.80	4.01	4.33	3.84	3.32	4.32	2.61	1.51	1.18	31.99
Monroe.....	0.83	1.39	1.77	3.38	3.92	4.60	3.58	3.76	5.40	2.83	1.61	0.97	34.04
Newton.....	0.90	1.12	1.79	3.16	4.50	4.49	3.68	3.55	4.10	2.58	1.53	1.15	32.55
Perry.....	0.89	1.21	1.61	2.63	4.07	4.42	3.72	4.19	4.17	2.43	1.40	0.90	31.64
Toledo.....	1.06	1.11	1.88	3.04	4.29	4.64	3.76	3.38	4.49	2.46	1.67	1.09	32.87
Van Meter.....	1.00	1.10	1.70	3.00	4.10	4.70	3.40	3.90	3.80	2.40	1.55	1.05	31.70
Waukee.....	1.09	1.17	1.69	3.29	4.00	4.35	4.03	3.79	4.19	2.22	1.42	1.02	32.26
Webster City.....	0.96	1.07	1.63	2.64	4.03	4.11	3.53	3.29	4.22	2.29	1.47	0.89	30.13
Average.....	0.96	1.12	1.73										

TEMPERATURE NORMALS

These normals have been so computed as to be equivalent to the averages of nearly a half century of records for all stations regardless of the actual length of record.

First order station normals are based on the averages of daily maximum and daily minimum temperatures determined separately for each calendar date. Every complete cycle like the annual march of temperature must, of course, close upon itself, that is, the normal value for a given day at the beginning of the cycle must be identical with the value of the same day one year later. Average values for corresponding days, even when derived from a long series of observations, rarely or never satisfy this requirement. It was found that weekly averages were the easiest to handle. It was also found that the averages would close upon themselves best in the yearly cycle by starting the year with July 3 and ending with July 2. For the stations at Charles City, Davenport, Dubuque, Keokuk and Omaha, records were used for the 46 years, July 3, 1875, to July 2, 1921, and at Des Moines, 42 years, ending the same time. At Sioux City the 39 years ending the same time were reduced to the 46-year period by comparing the shorter series with similar periods for nearest stations having 46-year records and applying the corrections necessary to reduce the weekly values to the full period of 46 years.

From these weekly normals intermediate daily values were easily interpolated for both maximum and minimum separately. The mean of the two normal extremes is considered to give a normal daily mean of great significance which is here published for these stations. For a more complete discussion, see Supplement No. 25, Monthly Weather Review, April, 1925.

Averages were made for these First Order Weather Bureau stations in and surrounding Iowa for the 10 years, 1921-1930, the differences between these and the 46-year normals were mapped for each month, and contour lines drawn. From these, interpolations were made for each cooperative station to reduce the 10-year mean to the 46-year normal. Then these trial normals were mapped. Where they did not line up well, adjustments were made. For stations having less than 10 years of record or records that are known to depart widely from current records due to recent changes in exposure, the new normals were interpolated from the maps.

NORTHWEST DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Alta, Alton, Cherokee, etc.

NORTH CENTRAL DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Algona, Allison, Belmont, etc.

NORTHEAST DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Decorah, Delaware, Dubuque, etc.

WEST CENTRAL DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Audubon, Carroll, Denison, etc.

CENTRAL DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Ames, Baxter, Boone, etc.

EAST CENTRAL DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Belle Plaine, Cedar Rapids, Clinton, etc.

SOUTHWEST DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Atlantic, Clarinda, Corning, etc.

SOUTH CENTRAL DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Afton, Albia, Centerville, etc.

SOUTHEAST DISTRICT

Table with 13 columns (STATIONS, Jan., Feb., Mar., Apr., May, June, July, Aug., Sept., Oct., Nov., Dec., Year) and 18 rows of station data including Bonaparte, Burlington, Columbus Junction, etc.

# CLIMATOLOGICAL DATA.

## IOWA SECTION

In co-operation with

IOWA WEATHER AND CROP BUREAU

CHARLES D. REED, Senior Meteorologist

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VOL. XLIII DES MOINES, IOWA, FEBRUARY, 1932 No. 2

## COMPARATIVE DATA FOR THE STATE—FEBRUARY

### GENERAL SUMMARY

The mean temperature for the State, 28.9°, was 6.9° above normal, and 6.5° colder than February, 1931. The maximum temperature for the stations occurred on either the 10th, 11th, 25th, 27th or 28th. The lowest temperature for the month was recorded on either the 1st, 3d or 4th. At most of the stations in the South Central and Southeast Districts the monthly minimum temperature did not reach the zero mark. New daily high temperature records were established at Des Moines on the 10th, 27th and 28th. The last five days of the month were unusually mild.

State-wide precipitation averaged 0.83 inch, or 71% of normal, and was below normal in all districts except the Southwest District. This is the first month during the last six months, having precipitation deficient of normal. There were no well defined precipitation periods but nearly all of it fell during the first half of the month. The number of days with precipitation 0.01 inch or more, averaged 5, which was exactly normal.

Snowfall averaged 78% of normal. The northern and southern districts had normal snowfall. The East Central District received the least snowfall. The snow cover was the heaviest in the Northwest District. Spencer and Pocahontas had measurable amounts of snow on the ground every day throughout February.

Average state-wide sunshine was slightly above the normal. Sioux City received the greatest amount, 67% of possible, and Davenport the least, 45%.

Extremely mild weather during the last 10 days of the month caused the frost to disappear from the ground generally. Since the ground was already saturated with water, the rapid thawing of snow caused considerable swelling of rivers and streams to handle the runoff during the closing four days. Very little damage, if any, was done by high water during February.

Ice harvest was nearly completed in the northwest half of the State, with the thickness running generally above 10 inches. The thickest ice harvested, 15 inches or more, was in a belt extending from Lyon, Osceola and Dickinson Counties southeast to Webster and thence east to Hardin County. Most of the ice was of good quality but in some places, particularly in the northwest counties, the top crust was soft and snowy or dirty. The crust was planed off leaving 10 to 12 inches of good ice. The Mississippi River counties south of Clayton harvested very little ice and will have to depend on manufactured or shipped ice for their supply.

YEAR	Temperature				Precipitation					Number of Days			
	Mean	Departure	Highest	Lowest	Total	Departure	Greatest	Least	Snowfall	With pre-.01 in. or more	Clear	Partly cloudy	Cloudy
1873.....	19.2	-2.8	49	-25	1.17	-0.01	2.52	0.30					
1874.....	21.2	-0.8	59	-20	1.28	+0.10	2.88	0.16					
1875.....	6.4	-15.6	48	-31	1.72	+0.54	6.75	0.82					
1876.....	25.5	+3.5	68	-16	1.11	-0.07	3.63	0.15					
1877.....	34.0	+12.0	63	-5	0.21	-0.97	0.65	0.00					
1878.....	31.4	+12.4	60	-8	0.59	-0.59	2.95	0.00					
1879.....	21.6	-0.4	57	-20	0.68	-0.50	1.90	0.10					
1880.....	27.4	+5.4	68	-12	0.64	-0.54	2.15	0.02					
1881.....	17.0	-5.0	57	-24	3.10	+1.92	6.35	0.97					
1882.....	33.5	+11.5	72	-12	0.91	-0.27	1.85	0.10					
1883.....	17.7	-4.3	62	-33	1.89	+0.71	6.13	0.06					
1884.....	18.3	-3.7	56	-23	1.32	+0.14	3.50	0.30					
1885.....	12.5	-9.5	54	-32	0.82	-0.36	2.50	0.10					
1886.....	21.2	-0.8	56	-34	0.59	-0.59	1.96	0.24					
1887.....	17.1	-4.9	60	-25	2.14	+0.96	5.64	0.12					
1888.....	20.2	-1.8	64	-34	1.01	-0.17	3.10	0.15					
1889.....	17.8	-4.2	62	-28	0.47	-0.71	1.70	0.00					
1890.....	25.1	+3.1	68	-24	0.83	-0.35	2.18	0.25					
1891.....	19.4	-2.6	70	-31	1.16	-0.02	2.41	0.55					
1892.....	28.1	+6.1	68	-20	1.20	+0.02	2.18	0.12	5.0	6	13	7	8
1893.....	16.0	-6.0	60	-28	1.39	+0.11	2.91	0.06	8.1	6	10	8	10
1894.....	19.7	-2.3	60	-19	0.89	-0.29	2.41	T.	8.4	3	16	8	4
1895.....	16.4	-5.6	73	-33	0.49	-0.69	1.34	0.02	3.3	4	13	9	6
1896.....	27.4	+5.4	78	-13	0.71	-0.47	2.40	0.04	5.4	4	12	9	8
1897.....	24.7	+2.7	61	-24	0.89	-0.29	1.81	0.22	8.0	5	6	10	12
1898.....	24.2	+2.2	62	-18	1.20	+0.02	3.65	0.10	7.8	5	10	9	9
1899.....	12.2	-9.8	75	-40	0.89	-0.29	4.32	0.12	7.1	5	11	10	7
1900.....	11.8	-7.2	60	-27	1.30	+0.12	4.57	0.18	9.9	6	10	8	10
1901.....	17.5	-4.5	49	-21	1.01	-0.17	3.00	0.12	9.7	4	15	7	6
1902.....	17.6	-4.4	62	-21	0.73	-0.45	2.39	0.02	2.6	4	13	8	7
1903.....	14.8	-2.2	56	-21	1.18	0.00	3.25	0.30	7.9	4	13	7	8
1904.....	14.8	-7.2	70	-26	0.41	-0.77	1.99	T.	4.5	4	10	9	10
1905.....	12.8	-9.2	69	-41	1.57	+0.39	2.97	0.44	15.5	7	14	6	8
1906.....	23.6	+1.6	66	-32	1.29	+0.11	2.91	0.20	6.1	5	14	7	7
1907.....	25.0	+3.0	65	-31	0.71	-0.47	1.95	0.06	4.6	4	14	6	8
1908.....	24.3	+2.3	59	-16	1.69	+0.51	3.95	0.23	8.9	6	12	6	11
1909.....	26.2	+4.2	62	-26	1.54	+0.36	4.72	0.30	7.7	5	11	6	11
1910.....	17.8	-4.2	58	-21	0.46	-0.72	2.09	T.	4.0	3	14	8	6
1911.....	27.3	+5.3	71	-13	2.76	+1.58	5.46	0.50	7.0	6	12	6	10
1912.....	18.1	-3.9	57	-30	1.21	+0.03	3.25	0.01	11.2	5	10	9	10
1913.....	20.2	-1.8	70	-24	0.82	-0.36	2.39	0.07	7.3	4	14	7	7
1914.....	16.8	-5.2	59	-29	0.87	-0.31	1.99	0.32	9.2	6	10	9	9
1915.....	29.1	+7.1	62	-8	2.93	+1.75	5.39	0.43	9.4	9	9	5	14
1916.....	19.0	-3.0	62	-32	0.55	-0.63	1.38	0.05	6.0	4	14	8	6
1917.....	15.2	-6.8	68	-37	0.36	-0.82	1.19	T.	3.5	3	14	8	6
1918.....	23.0	+1.0	70	-36	0.95	-0.23	2.10	0.09	6.0	5	14	7	7
1919.....	24.9	+2.9	65	-16	2.42	+1.24	4.12	0.32	9.9	8	11	5	12
1920.....	24.0	+2.0	59	-22	0.56	-0.62	1.75	0.04	4.1	5	9	6	14
1921.....	31.0	+9.0	76	-5	0.77	-0.41	2.00	T.	6.5	5	13	7	8
1922.....	23.7	+1.7	70	-20	1.59	+0.41	4.56	0.40	1.3	4	14	7	7
1923.....	20.1	-1.9	61	-23	0.40	-0.78	1.71	0.00	3.2	3	13	8	7
1924.....	25.8	+3.8	70	-15	1.27	+0.09	4.00	0.30	11.2	7	15	5	9
1925.....	28.4	+6.4	66	-16	0.82	-0.36	3.69	T.	2.6	4	11	7	10
1926.....	31.2	+9.2	67	-2	0.76	-0.12	2.13	0.04	3.3	4	10	7	11
1927.....	30.6	+8.6	65	-17	1.15	-0.03	3.60	0.13	4.4	5	13	6	9
1928.....	28.6	+6.6	65	-14	1.95	+0.77	3.97	0.62	4.4	7	15	5	9
1929.....	14.0	-8.0	52	-35	1.31	+0.13	3.03	0.34	12.5	8	10	7	11
1930.....	35.5	+13.5	80	-34	0.67	-0.51	2.45	0.06	2.8	5	11	10	7
1931.....	35.4	+13.4	85	-4	0.25	-0.93	1.13	T.	0.9	2	16	5	7
1932.....	28.9	+6.9	74	-16	0.83	-0.35	2.27	0.03	5.1	5	12	8	9
Normals.....	22.0		63	-23	1.18		3.00	0.20	6.5	5	12	7	9
Highest.....	35.5		80	-2	3.10		6.75	1.32	15.5	9	16	10	16
Lowest.....	6.4		48	-41	0.21		0.65	0.00	0.9	2	6	5	4

T. indicates an amount too small to measure, or less than .005 inch rainfall and less than .05 inch snowfall.

### TEMPERATURE

The mean temperature for the State, derived from the means of 9 districts of nearly equal area, and based on the records of 105 stations, was 28.9°, or 6.9° above normal. All of the Iowa stations had temperature above normal. The greatest district excess, 8.9°, was in the East Central District and the least district excess, 4.9°, was in the Northwest District. The highest monthly mean was 38.0° at Keokuk and the lowest, 20.1°, at Northwood. The absolute range in temperature for the State was 90°, ranging from 74° at Keokuk No. 2 on the 10th, to -16° at Webster City, Inwood (near), and Sanborn on the 3d. Cold waves occurred on the 1st, 3d, 4th, 8th, 17th, 18th and 22d.

The average number of days with the maximum temperature 32° or below was 8, ranging from 13 days in the Northwest District,



Climatological Data for February, 1932

STATIONS	COUNTIES	Elevation, feet	Length of record, years	Temperatures, in Degrees Fahrenheit						Precipitation, in inches				Number of Days			OBSERVERS	
				Mean	Departure from normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from normal	Greatest in 24 hours	Total snowfall (unmelted)	Precipitation, .01 in. or more	Clear		Partly cloudy
<i>Northwest District</i>																		
Akron.....	Plymouth	1,153	5															Orlan C. Moore
Alta.....	Buena Vista	1,513	42	23.3	+ 4.8	55	28	- 8	3	29	0.72	- 0.28	0.38	5.5	6	13	8	D. E. Hadden
Alton.....	Sioux	1,305	27	23.7	+ 5.8	60	28	-12	3	37	0.95	+ 0.06	0.30	8.7	7	12	10	W. S. Slagle
Cherokee.....	Cherokee	1,196	12	23.0	+ 4.4	57	28	-12	3	27	0.46	+ 0.34	0.26	8.0	4	14	6	J. E. Wirth
Estherville.....	Emmet	1,298	38	23.0	+ 6.4	56	28	-10	3	34	0.57	- 0.30	0.25	6.5	5	19	6	A. O. Peterson
Hawarden.....	Sioux	1,181	6															
Inwood (near).....	Lyon	1,474	29	21.0	+ 4.4	58	10	-14	3	33	0.58	- 0.27	0.35	8.4	7	16	4	Earl V. Slife
Lake Park (near).....	Dickinson	1,489	20	20.2	+ 3.8	53	28	-14	3	33	0.68	- 0.08	0.45	7.4	7	16	5	A. C. Hanson
Lake Park (near).....	Dickinson	1,489	20	20.2	+ 3.8	53	28	-14	3	33	0.50	+ 0.38	0.39	4.0	3	12	6	P. M. Lawrence
Lake Park (near).....	Dickinson	1,489	20	20.2	+ 3.8	53	28	-14	3	33	0.50	+ 0.38	0.39	4.0	3	12	6	P. M. Lawrence
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Lake Park (near).....	Dickinson	1,489	20	20.2	+ 3.8	53	28	-14	3	33	0.50	+ 0.38	0.39					

Climatological Data for February, 1932—Continued

STATIONS	COUNTIES	Elevation, feet	Length of record, years	Temperatures, in Degrees Fahrenheit						Precipitation, in inches				Number of Days			Prevaling direction of wind	OBSERVERS		
				Mean	Departure from normal	Highest	Date	Lowest	Date	Greatest daily range	Total	Departure from normal	Greatest in 24 hours	Total snowfall (unmelted)	Precipitation, .01 in. or more	Clear			Partly cloudy	Cloudy
<i>East Central District</i>																				
Belle Plaine.....	Benton	866	56	31.6	+ 8.7	66	28	3	4	36	0.70	- 0.76	0.49	1.0	5	15	7	7	sw.	O. C. Burrows J. T. Wurster Dr. A. P. Bryant U. S. Weather Bureau Prof. J. F. Reilly
Cedar Rapids.....	Linn	737	50	32.0	+ 9.4	64	28	5	4	35	0.40	- 0.92	0.22	0.3	3	14	1	14	se.	
Clinton.....	Clinton	595	61	32.6	+ 8.2	68	25	10	1†	41	0.68	- 1.18	0.40	3.2	6	16	2	11	n.	
Davenport.....	Scott	580	61	34.0	+ 9.1	69	25	12	4	39	1.00	- 0.62	0.52	5.2	6	4	15	10	w.	
Iowa City.....	Johnson	733	75	32.8	+ 9.1	66	28	5	4	37	0.27	- 1.28	0.15	2.0	5	10	10	9	nw.	
La Claire.....	Scott	576	55								0.93	- 0.63	0.51	6.0	6					Margaret T. Disney John Strodhoff William Molis Mrs. L. Stingley John Kroepfen
Maquoketa (near).....	Jackson	692	39	31.6	+ 9.4	63	28	8	1	40	0.36	- 1.04	0.20	T.	3	19	1	9	nw.	
Muscataine.....	Muscataine	546	86								1.00	- 0.88	0.60	0.7	7					
Olin.....	Jones	750	31	31.9	+ 9.3	65	25	9	1†	37	0.16	- 1.24	0.15	0	2	16	4	9	nw.	
Tipton (near).....	Cedar	806	40	31.6	+ 8.4	65	25	10	1†	36	0.03	- 1.36	0.03	0.5	1	7	10	12	w.	
Williamsburg.....	Iowa	805	16	32.3	+ 8.8	67	28	2	4	40	0.21	- 1.16	0.16	T.	3	19	6	4	nw.	Dr. F. C. Schadt
Means and extremes.....				32.2	+ 8.9	69	25	2	4	41	0.52	- 1.01	0.60	1.7	5	13	6	10	nw.	
<i>Southwest District</i>																				
Atlantic.....	Cass	1,110	45	30.3	+ 6.7	69	28	- 3	4	38	0.99	- 0.14	0.53	3.9	4	9	11	9	sw.	Roy L. Fancolly Arthur L. Bishop Dr. H. C. Hawley W. J. Wagner Carl E. Pollock
Bedford.....	Page	1,200	28								1.30	- 0.01	0.50	9.0	4	11	6	12	nw.	
Clarinda.....	Taylor	1,009	60	32.7	+ 6.7	73	28	- 5	4	37	1.04	- 0.05	0.49	7.0	3	14	8	7	w.	
Corning.....	Adams	1,294	44	31.0	+ 6.7	67	28	- 5	4	32	1.70	+ 0.60	0.60	10.0	3	11	9	9	nw.	
Cumberland (near).....	Cass	1,225	33								1.08	+ 0.11	0.60	4.0	4	11	10	8	nw.	
Glenwood.....	Mills	1,100	42	31.6	+ 6.1	68	28†	- 4	4	32	1.13	+ 0.27	0.62	4.7	5	11	9	9	nw.	Dr. George Mogridge P. C. Cornell J. L. Hurley W. S. Matthews B. R. Bridge
Greenfield.....	Adair	1,368	36								1.02	- 0.02	0.55	4.7	6	7	16	6	se.	
Lenox.....	Taylor	1,250	37	32.5	+ 7.6	71	28	- 3	4	37	1.23	+ 0.24	0.50	9.9	7	15	6	8	nw.	
Oakland.....	Pottawattamie	1,139	18	30.2	+ 5.8	66	28	- 3	4	39	0.79	- 0.26	0.50	2.5	3	12	4	13	nw.	
Red Oak (near).....	Montgomery	1,030	25								1.04	+ 0.11	0.43	7.7	5	12	8	9	nw.	
Riverton (near).....	Fremont	920	6								0.87	- 0.23	0.51	7.2	3	7	4	18	nw.	George C. Rader H. H. Askew U. S. Weather Bureau
Thurman.....	Fremont	960	45	32.3	+ 6.4	71	28	- 6	4	38	0.95	- 0.24	0.43	6.5	3	10	5	14	n.	
Omaha, Neb.....		1,105	67	30.8	+ 5.3	64	28	0	4	25	0.97	+ 0.04	0.48	4.7	6	9	8	12	nw.	
Means and extremes.....				31.4	+ 6.4	73	28	- 6	4	39	1.09	+ 0.04	0.62	6.2	4	11	8	10	nw.	
<i>South Central District</i>																				
Afton.....	Union	1,212	51	32.2	+ 7.3	69	28	- 2	4	33	1.19	+ 0.01	0.40	11.0	6	13	9	7	ne.	S. R. Brown J. M. Stevenson Thos. Wood, Jr. C. C. Burr J. C. Davis
Albia.....	Monroe	949	41	33.9	+ 8.5	73	28	0	4	41	0.74	- 0.59	0.72	6.8	2	10	4	15	nw.	
Centerville.....	Appanoose	1,013	39	35.3	+ 9.3	71	28	0	4	36	0.70	- 0.72	0.37	3.4	6	13	6	10	sw.	
Chariton (near).....	Lucas	1,042	38	32.3	+ 7.5	70	28	0	4	39	0.71	- 0.40	0.21	5.0	4	10	11	8	sw.	
Chorydon (near).....	Wayne	1,050	48	32.9	+ 7.5	68	28	0	4	32	0.82	- 0.53	0.42	7.0	7	11	7	11	nw.	
Creston.....	Union	1,293	31	31.0	+ 7.1	69	28	- 5	4	36	0.89	- 0.19	0.42	7.0	6	6	14	9	n.	Mrs. N. Spangler Seth F. Shenton W. J. Casey J. B. Alter F. S. Parks
Indianola.....	Warren	972	51	32.6	+ 8.5	71	28	1	4	37	0.64	- 0.56	0.36	2.5	5	10	11	8	se.	
Knoxville.....	Marion	920	42	32.6	+ 8.3	71	28	0	4	38	0.81	- 0.43	0.40	6.5	6	11	8	10	nw.	
Lacona.....	Warren	824	33								2.27	+ 0.59	0.88	9.2	9	8	14	7	nw.	
Lamoni.....	Decatur	1,123	28	32.5	+ 7.3	70	28	- 4	4	37	0.73	- 0.66	0.30	8.2	6	12	8	9	nw.	
Melrose.....	Monroe	871	2								0.75	- 0.55	0.55	6.5	4	15	5	9	sw.	J. M. Carr E. O. Gleason James A. Verploegh D. M. Coleman H. S. Ely
Mt. Ayr.....	Ringgold	1,220	40	32.7	+ 7.6	70	28	- 2	4	33	1.29	+ 0.07	0.80	10.0	5	17	4	8	s.	
Tingley.....	Ringgold	1,275	8	31.9	+ 7.2	69	28	- 4	4	32	1.25	+ 0.05	0.52	10.7	6	15	7	7	se.	
Tracy.....	Marion	725									0.67		0.50	7.4	3					
Winterset.....	Madison	1,118	41	32.4	+ 8.0	70	28	0	4	33	0.56	- 0.55	0.46	3.0	4	18	5	6	nw.	
Means and extremes.....				32.7	+ 7.7	71	28	- 5	4	41	0.93	- 0.34	0.88	6.9	5	12	8	9	nw.	
<i>Southeast District</i>																				
Bonaparte (near).....	Van Buren	563	45	35.1	+ 8.8	71	28	6	4	41	0.42	- 0.88	0.18	2.4	4	14	5	10	sw.	B. R. Vale John W. Donnelly Miss Musa Todd R. M. McKenzie U. S. Weather Bureau
Burlington.....	Des Moines	544	42	36.2	+ 8.6	70	10†	11	4	40	0.98	- 0.78	0.46	4.3	6	15	5	9	sw.	
Columbus Junction.....	Louisa	595	41	33.6	+ 8.0	68	25	6	4†	41	0.72	- 0.82	0.50	7.2	4	12	9	8	nw.	
Fairfield.....	Jefferson	780	52	33.4	+ 8.9	69	28	3	4	40	0.58	- 1.07	0.42	5.8	6	12	7	10	nw.	
Keokuk.....	Lee	614	61	38.0	+ 9.7	73	10	13	4	38	0.98	- 0.62	0.59	2.1	7	8	11	10	sw.	
Keokuk No. 2.....	Lee	651	3	37.5	+ 9.6	74	10	11	1	41	0.85	- 0.65	0.51	3.0	7					J. N. D. Dickinson Dr. J. W. Rinabarger J. H. Jericho R. R. Robinson C. L. Mikesh
Keosauqua.....	Van Buren	639	45	35.4	+ 9.5	73	28	8	4†	45	0.40	- 1.06	0.32	5.0	3	11	12	6	nw.	
Mt. Pleasant.....	Henry	730	56	34.7	+ 8.1	70	28	7	4	40	0.56	- 0.82	0.35	6.0	5	10	9	10	se.	
Oskaloosa.....	Mahaska	835	56	32.4	+ 8.2	70	28	- 1	4	37	1.25	+ 0.05	0.56	10.9	10	12	7	10	sw.	
Ottumwa.....	Wapello	649	45	34.4	+ 9.4	71	28	4	4	40	0.61	- 0.83	0.44	5.3	4	6	13	10	se.	
Sigourney.....	Keokuk	785	37	32.3	+ 8.0	70	28	0	4	40	0.89	- 0.52	0.80	10.0	2	12	10	7	s.	John B. Slate C. L. Beswick D. D. Sherman
Stockport (near).....	Van Buren	747	31	34.0	+ 8.7	71	25†	5	4	44	0.73	- 0.67	0.53	5.0	4	12	6	11	nw.	
Washington.....	Washington	757	33	33.7	+ 8.3	69	25	6	4†	40	0.90	- 0.46	0.48	6.0	4	11	5	13	w.	
Means and extremes.....				34.6	+ 8.6	74	10	- 1	4	45	0.76	- 0.72	0.80	5.6	5	11	8	10	sw.	
State means and extremes.....				28.9	+ 6.9	74	10	- 16	3	47	0.83	- 0.35	1.33	5.1	5	12	8	9	nw.	

Temperature normals are based on the inter-station relationships during the 10-year period ending December 31, 1930, harmonized with the normals for the 46-year period, July 3, 1875 to July 2, 1921. Precipitation normals are based on the 50-year period, ended December 31, 1927 at first order stations; upon all records of 10 years or more ending December 31, 1930 for most of the co-operative observing stations; and upon interpolations from normal maps for recently established stations.

Reference letters a, b, c, etc., appearing in the table indicate the number of days missing; for example b represents two days, etc.

T. Precipitation is less than 0.005 inch rain or melted snow.

†† Received too late to be included in means and summaries.

† Also other dates.

to 3 days in the Southeast District. The average number of days with the minimum temperature 32° or below was 26, ranging from 28 days in the North Central and Northeast Districts, to 24 days in the Southwest, South Central and Southeast Districts. The average number of days with the minimum temperature 0° or below was 2, ranging from 5 days in the Northwest and North Central Districts, to none in the East Central and Southeast Districts.

For individual stations the number of days with the maximum temperature 32° or below ranged from 17 days at Lake Park (near) to 1 day at Burlington. The number of days with the minimum

temperature 32° or below ranged from 29 days at 20 stations, to 20 days at Keokuk. The number of days with the minimum temperature 0° or below ranged from 8 days at Inwood (near) and Forest City, to none at 27 stations. The greatest daily range in temperature at any one station was 47° at Grundy Center on the 8th.

PRECIPITATION

The average precipitation for the State, derived from the averages of 9 districts of nearly equal area, and based on the records of 118 stations, was 0.83 inch, or 0.35 inch below normal. The only





Daily Precipitation for February, 1932—Continued

Stations	Drainage Basin	Day of Month																															Totals			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
<i>Southwest District</i>																																				
Atlantic	Nishnabotna	.12			T.																															0.99
Bedford	Nishnabotna				.40							.10		.31	.03	.53	T.				T.	T.													1.30	
Clarinda	Nodaway				.40									.15		.49					T.														1.04	
Corning	Nodaway	T.	T.	T.	.60							T.		.60	T.	.50																			1.70	
Cumberland (near)	Nodaway	.11		T.	T.						T.			.36		.60																			1.08	
Glenwood	Missouri	.02			.25						T.	T.		.20	T.	.62						.04													1.13	
Greenfield	Nodaway	.02	.05	.10										.25		.55						.05													1.02	
Lenox	Missouri	T.	.02	T.	.50								.04		.40	.05	.20						.02												1.23	
Oakland	Nishnabotna	T.		.05										.24		.50						T.													0.79	
Red Oak (near)	Nishnabotna				.27							T.		.12	.04	.43						.18													1.04	
Riverton (near)	Nishnabotna	T.	T.	T.	.22							T.	T.	.14	T.	.51						T.									T.				0.87	
Thurman	Missouri				.36							T.	T.	.16	T.	.43						T.	T.												0.95	
Omaha, Neb.***	Missouri	T.	T.	.02							T.		T.	.26	.17	.01	.48						.03	T.											0.97	
<i>South Central District</i>																																				
Afton	Grand	.03		T.	.37								T.	.26	.07	.40						.06													1.19	
Albia	Des Moines	T.	T.	T.	.72				T.			T.		T.	.02	T.	T.					T.													0.74	
Centerville	Chariton	T.	.02	T.	.20						.08	T.		.22		.01																			0.70	
Chariton (near)	Chariton	T.		T.	.21						.19			.21	T.	.10																			0.71	
Corydon (near)	Chariton	T.	.06	T.	.42						.09			.08	.04	.10						T.													0.82	
Creston	Missouri	.02	T.	.01	.32							T.		.08	.04	.42					T.	T.													0.89	
Indianola	Des Moines	.01	T.		.10							T.		.16	T.	.36	T.					.01	T.												0.64	
Knoxville	Des Moines	.07	T.		.40						.07			.10	.10	.07																			0.81	
Lacona	Des Moines	.10			.60						.25	.03		.20	.10	.88						.01	.10											2.27		
Lamoni	Grand		T.		.11						.01		.01	.20	.10	.30						T.												0.73		
Melrose	Des Moines	T.	T.		.55								T.	.03		.15							.02												0.75	
Mt. Ayr	Grand				.80								.14	.18	.15	.02						T.													1.29	
Tingley	Platte	.03	T.		.52								.05	.42	.06	.17	T.																		1.25	
Tracy	Des Moines	T.	T.		.50							T.	T.	.04		.13	T.					T.													0.67	
Winterset	Des Moines	T.										T.		.05	.02	.46							.03												0.56	
<i>Southeast District</i>																																				
Bonaparte (near)	Des Moines		T.	.06	.10							.18	T.	.08	T.	T.						T.													0.42	
Burlington	Mississippi	T.	.02	.17	.23							.46		.07		.03	T.																		0.98	
Columbus Junction	Iowa		.02	T.	.50							.17	T.	T.		.03																			0.72	
Fairfield	Skunk		.01	.02	.40							.10	T.		.03	.02																			0.58	
Keokuk**	Mississippi	.01	T.	.16	.11							.59	T.	.07	.02	T.						.02													0.98	
Keokuk No. 2	Mississippi		.02	.10	.13							.51	T.	.05	T.	.02						.02													0.85	
Keosauqua	Des Moines	T.	T.	.08	.24							T.		.08	T.																				0.40	
Mt. Pleasant	Skunk				.04	.31						.15	T.	.03		.03																			0.56	
Oskaloosa	Des Moines	.01	.05	.04	.56							.23	.01	.07	.02	.24	T.					T.	.03												1.25	
Ottumwa	Des Moines		T.	T.	.41							.09	T.	.04		.04																			0.61	
Sigourney	Skunk		T.		.80								T.	T.		.09																			0.89	
Stockport (near)	Skunk		T.	.08	.45							.12	T.		.08																				0.73	
Washington	Skunk		.02		.48							.32	T.		T.		.08	T.																	0.90	

Except as otherwise indicated, observations are generally made late in the afternoon, near sunset, and precipitation recorded is for 24 hours ending at the time of observation.

\*\*\* Regular Weather Bureau Station; precipitation is for 24-hour period midnight to midnight.

T. Precipitation is less than 0.005 inch rain or melted snow.

i. Interpolated.

PRESSURE, RELATIVE HUMIDITY, WIND AND SUNSHINE

Stations	Barometric Pressure, Inches (Sea Level)					Relative Humidity, %					Wind					Sunshine	
	Mean	Highest	Date	Lowest	Date	Mean				Total movement	Maximum						
						7 A. M.	12 Noon	7 P. M.	Lowest		Date	Average hourly velocity	Miles	From	Date		% possible departure from normal
Chas. City	30.03	30.63	14	28.99	11	86	71	82	55	29	5,367	7.7	27	w.	11	56	+3
Davenport	30.03	30.68	1	29.06	11	80	65	67	49	25	7,545	10.8	35	w.	11	45	-7
Des Moines	30.04	30.67	1	29.07	11	82	63	72	44	6	6,851	9.8	36	n.w.	11	60	+3
Dubuque	30.02	30.76	1	29.00	11	81	64	66	34	22	5,373	7.7	24	n.w.	8	51	-1
Keokuk	30.06	30.64	1	29.14	11	77	57	63	28	22	5,817	8.4	28	w.	11	60	+5
Sioux City	30.04	30.54	14	29.12	11	88	71	77	52	5	7,639	11.0	40	n.w.	11	67	+10
Omaha, Nb	30.05	30.63	1	29.14	11	82	66	74	42	28	5,822	8.4	28	n.w.	7	60	+1
Means and extremes	30.04					82	65	72				9.1				57	+2
Normals and records	30.10	30.76	1	28.99	11				28	22			40	n.w.	11		
		\$31.07	1918	*28.69	1902	83		74		22d					4th	55	
									13	1880			\$56	n.w.	1917		

\$Sioux City \*Davenport †Des Moines ‡Local mean time.

‡‡ True velocities obtained from corrected indicated velocities of 4-cup anemometers began January 1, 1932. See Climatological Data, January, 1932, page 7.

district excess was in the Southwest District, 0.04 inch, while the East Central District had the greatest district deficiency, 1.01 inches. The greatest precipitation excess at any one station was 0.72 inch at Marathon, and Tipton (near) had the greatest deficiency, 1.36 inches. The greatest amount at a single station was

2.27 inches at Lacona and the least was 0.03 inch at Tipton (near). The greatest amount in 24 consecutive hours was 1.33 inches at Marathon on the 16th.

The average number of days with 0.01 inch or more of precipitation for the State was 5, ranging from 6 days in the Northwest District, to 4 days in the West Central, Central and Southwest Districts. For individual stations, the range was from 10 days at Oskaloosa to 1 day at Tipton (near).

SNOWFALL

The average snowfall for the State was 5.1 inches, or 1.4 inches below normal. All of the stations except Maquoketa, Baxter, Williamsburg and Olin received measurable amounts. The greatest district average was in the Northwest District, 7.9 inches, and the East Central District had the least district average, 1.7 inches. The greatest total snowfall at any one station for February was 12.2 inches at Sanborn, and the least was only a trace at Baxter, Williamsburg and Maquoketa and none at Olin. The greatest snowfall in 24 consecutive hours was 10.0 inches at Sigourney on the 4th. The greatest number of days with 0.1 inch or more of snow on the ground was 29 at Spencer and Pocahontas. The greatest depth of snow on the ground at any time was 26.0 inches at Marathon on the 1st.

ERRATA

Report for January, 1932. Page 1; The word "precipitation" in the fourth line of the temperature summary should be "temperature." The word "Onawa" in the fifth line of the temperature summary should be omitted.

THE WINTER OF 1931-1932

The mean temperature for the three winter months was 28.5°, which is 7.0° above the normal for the State, and 1.8° below the mean of 1930-31. The winter was characterized by the mildest

Daily Maximum and Minimum Temperature for the Month of February, 1932

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Mean	
<i>Northern Division</i>																																	
Algona.....	(Maximum.....	20	21	12	14	38	39	38	28	39	44	38	20	21	18	26	34	31	35	28	36	36	27	31	34	46	44	50	52	43			32.5
	(Minimum.....	-7	12	-8	-7	8	21	12	-3	16	27	18	7	4	3	12	25	7	3	11	9	26	6	11	25	30	32	38	33			13.8	
Alta.....	(Maximum.....	16	19	8	13	39	38	39	21	40	43	40	19	20	16	27	34	24	33	29	35	38	27	31	33	46	48	51	55	42			31.9
	(Minimum.....	-6	8	-8	-7	11	20	18	-2	21	27	16	8	5	11	24	5	4	8	12	25	9	13	29	32	31	34	36	36			14.7	
Alton.....	(Maximum.....	15	20	10	12	39	38	42	22	41	44	38	23	23	18	27	34	25	39	29	38	40	28	32	31	50	50	48	60	45			33.2
	(Minimum.....	-3	10	-12	-8	9	22	21	-1	18	24	20	9	5	6	22	25	5	2	7	11	20	10	16	27	30	30	32	34	30			14.2
Belmond.....	(Maximum.....	26	30	14	10	28	42	40	34	40	46	44	26	23	22	27	35	36	38	27	36	39	30	32	37	45	44	54	54	46			34.7
	(Minimum.....	-4	11	-10	-8	10	25	13	-1	19	26	19	10	5	5	14	25	5	3	11	6	21	8	11	28	30	29	30	31	33			14.0
Charles City.....	(Maximum.....	28	28	11	16	37	39	36	22	39	46	43	20	20	17	29	35	31	33	26	35	39	19	31	34	47	43	48	52	45			32.7
	(Minimum.....	0	8	-6	-7	9	17	10	1	22	28	17	10	5	6	16	28	5	5	8	9	19	8	9	30	31	29	31	31	32			14.2
Decorah.....	(Maximum.....	20	25	14	19	35	38	35	34	42	47	47	23	18	18	28	35	35	33	25	36	38	28	30	35	41	44	52	53	44			33.6
	(Minimum.....	-6	13	-4	-5	11	20	14	1	18	28	23	11	6	5	11	28	5	-6	10	1	28	8	3	26	28	30	34	28	33			14.0
Dubuque.....	(Maximum.....	32	35	21	22	42	44	38	30	42	57	57	29	29	24	35	38	37	41	30	38	48	30	33	40	61	55	58	60	55			40.0
	(Minimum.....	8	18	7	7	16	28	24	11	25	32	25	18	13	16	19	32	13	13	19	18	29	17	11	30	34	37	33	39			21.4	
Forest City.....	(Maximum.....	16	22	13	15	35	40	37	35	37	46	38	23	22	16	23	35	37	33	28	36	39	28	30	32	46	47	50	52	45			33.0
	(Minimum.....	-10	10	-12	-11	3	15	18	-5	10	25	23	5	-1	1	9	16	0	-2	11	6	20	2	3	23	25	25	27	28			9.9	
Independence.....	(Maximum.....	27	33	18	18	39	43	36	35	42	50	50	31	27	23	31	37	34	33	39	36	43	31	32	36	54	51	55	58	50			37.7
	(Minimum.....	4	16	-2	-3	7	25	23	5	22	31	25	16	10	10	16	27	12	10	11	16	29	12	12	28	29	31	33	30	34			17.9
Inwood.....	(Maximum.....	13	13	11	12	36	34	38	20	37	48	38	17	19	16	25	32	24	31	28	36	35	26	31	32	43	46	51	55	41			30.7
	(Minimum.....	-6	0	-16	-12	7	20	14	-4	14	24	15	6	2	6	10	23	-1	-2	0	10	17	7	14	21	27	32	34	37	31			11.4
Lake Park.....	(Maximum.....	14	16	7	13	32	32	34	19	38	40	34	28	20	24	24	33	25	30	30	35	34	24	30	31	42	42	48	53	41			30.1
	(Minimum.....	-5	3	-14	-10	5	16	15	-5	12	24	14	5	1	1	8	24	2	1	-3	6	11	3	8	17	28	30	34	33	35			10.3
Mason City.....	(Maximum.....	23	25	14	11	34	41	35	32	36	45	37	22	17	17	26	33	31	30	27	36	37	27	30	32	42	38	49	52	41			31.7
	(Minimum.....	-7	12	-13	-10	8	19	15	-3	15	26	19	12	3	2	13	26	3	3	11	1	25	4	6	27	30	28	29	28	30			12.5
New Hampton.....	(Maximum.....	25	31	15	15	36	40	35	35	38	47	45	23	20	17	28	35	34	32	35	34	37	29	30	34	44	48	49	52	47			34.0
	(Minimum.....	-4	4	-8	-8	5	18	10	-1	17	29	21	10	5	5	18	22	-3	-3	12	5	26	6	6	29	30	43	41	31	31			12.7
Northwood.....	(Maximum.....	16	20	9	13	35	37	35	15	37	43	37	20	18	15	26	35	18	35	30	34	35	25	27	31	43	42	47	48	43			30.0
	(Minimum.....	-10	5	-10	-9	2	16	8	-4	12	27	18	5	0	0	10	18	2	2	8	2	25	3	3	20	28	30	28	31			10.2	
Pocahontas.....	(Maximum.....	20	20	15	16	37	39	39	29	40	45	37	21	21	19	28	35	29	34	28	38	37	28	32	34	44	45	51	53	44			33.0
	(Minimum.....	-5	12	-10	-10	9	20	19	-3	18	21	19	7	0	5	13	26	3	1	9	6	27	8	12	28	34	31	28	33	34			13.5
Postville.....	(Maximum.....	20	32	13	21	34	34	40	34	40	47	49	34	21	26	29	33	32	35	24	33	40	28	29	36	51	48	52	51	48			35.0
	(Minimum.....	0	11	-8	-8	8	18	18	2	17	28	30	16	6	10	15	27	7	5	10	10	28	8	5	28	28	30	33	30	32			15.3
Rock Rapids.....	(Maximum.....	12	17	10	13	37	33	38	22	38	43	35	18	20	20	25	32	25	34	31	37	37	29	30	34	47	54	56	43			31.6	
	(Minimum.....	-3	8	-12	-7	3	18	17	-2	13	21	11	6	5	2	10	17	2	0	2	8	10	6	13	23	27	31	30	28			10.9	
<i>Central Division</i>																																	
Ames.....	(Maximum.....	30	33	17	18	39	41	41	36	41	52	47	29	28	25	28	35	34	38	31	35	42	32	35	38	56	60	61	63	50			38.6
	(Minimum.....	1	15	1	-1	13	25	23	4	22	30	29	16	12	12	18	27	14	14	19	21	31	15	18	31	32	33	32	33			19.6	
Belle Plaine.....	(Maximum.....	30	31	21	24	46	50	41	37	48	61	57	35	35	27	31	37	37	43	33	40	50	33	37	35	63	60	62	66	53			42.3
	(Minimum.....	7	21	6	3	13	29	25	8	23	34	32	19	4	17	29	30	17	14	23	19	33	16	17	31	30	25	29	30			20.9	
Carroll.....	(Maximum.....	27	25	15	17	40	46	47	32	40	54	45	27	24	20	27	33	30	35	28	37	39	32	34	35	50	53	58	61	53			36.7
	(Minimum.....	-7	10	-1	-5	12	20	22	1	23	28	25	12	10	8	13	25	12	10	13	13	29	13	15	28	31	34	36	37	35			17.3
Cedar Rapids.....	(Maximum.....	33	35	25	27	46	46	39	36	46	59	56	35	33	29	33	38	40	42	35	40	51	36	36	38	61	58	63	64	57			42.8
	(Minimum.....	9	21	9	5	14	26	26	9	23	29	33	19	14	18	19	29	17	13	23	16	32	16	16	28	29	28	32	30	31			21.2
Davenport.....	(Maximum.....	39	38	28	25	38	45	39	34	46	61	61	37	37	29	35	46	40	40	32	40	50	35	34	42	69	60	59	65	56			43.4
	(Minimum.....	13	22	16	12	15	29	21	13	26	36	33	23	19	21	23	33	18	18	24	23	31	21	17	31	30	35	36	33	38			24.6
Des Moines.....	(Maximum.....	35	34	17	24	45	48	44	31																								

December in 42 years, and a rather warm January and February. Out of 59 winters for which State-wide average temperatures are available, only five have been warmer. The warmest winter of record was 1877-78, with a mean of 32.2°, and the coldest, 1874-75, with a mean of 11.8°. The highest temperature during the winter was 74° at Keokuk No. 2 on February 10. The lowest temperature was -22° at Washta and Forest City on January 31, and Little Sioux on January 30.

The average monthly precipitation for the State was 1.71 inches, and the average total was 5.12 inches, or 1.77 inches above the normal. Out of 59 winters only two have received more. The winter having the greatest total precipitation of record was 1914-15, with an average total of 5.86 inches. The next greatest was 1873-74 with 5.46 inches. The driest winter of record was 1930-31, with a total of 1.32 inches. December precipitation averaged 2.48 inches, which was 1.34 inches above normal, January was 1.81 inches, or 0.78 inch above normal, and February, 0.83 inch, or 0.35 inch below normal.

The average total snowfall for the winter was 24.4 inches, which is 5.1 inches above normal, and 15.4 inches more than the winter of 1930-31. The northwest portion of the State received the most snowfall, and also had the longest period of measurable snow cover. The snowiest winter since state-wide snowfall records began in the winter of 1892-93, was 1904-05 with an average total of 38.9 inches.

The precipitation for the fall of 1931 being in excess of the normal and the subsoil saturated with water, the rapid thawing during the last 10 days of February caused considerable swelling of rivers and streams. Also the heavy rains during the last few days of December caused rivers in the lower districts to reach flood stages. The extremely mild weather during the last decade of February caused the frost to disappear from the ground generally.

The average total number of days with 0.01 inch or more of precipitation was 21, or 13 days more than for the same season of last year, and has only been exceeded twice. The winter of 1914-15 had the greatest, 26 days.

The average number of clear days was 32, partly cloudy, 18 and cloudy, 41; as compared with 46 clear days, 17 partly cloudy and 27 cloudy days during the winter of 1930-31.

N. G. R.

MISCELLANEOUS PHENOMENA

- Clouds (mammato-cumulus) : 3d.
- Cold Waves: 1st, 3d, 4th, 8th, 17th, 18th, 22d.
- Corona, lunar: 9th, 18th, 25th.
- Fog, dense: 6th, 7th, 9th, 10th, 11th, 16th, 20th, 23d, 24th, 25th, 26th, 28th.
- Fog, light: 6th, 7th, 9th, 10th, 11th, 16th, 20th, 21st, 23d, 24th, 25th, 26th, 28th, 29th.
- Frogs croaking: Corydon (near) on the 27th and 28th.
- Gales: 7th, 8th, 10th, 11th, 12th, 19th, 29th.
- Glaze: 13th, 16th.
- Hail, light: 11th.
- Halo, lunar: 13th, 18th, 24th.
- Halo, solar: 9th, 10th, 20th.
- Migrations of birds: Boone (near), ducks on 27th, bluebirds on 28th; Riverton (near), bluebirds on 24th, Killdeers on 28th.
- Parhelia: 11th, 17th.
- Sleet: 1st, 2d, 3d, 6th, 15th, 16th, 20th.
- Snow: 1st, 2d, 6th, 7th, 11th, 13th, 14th, 15th, 16th, 17th, 19th, 24th.
- Thunderstorms: 10th, 11th, 12th, 22d.

RIVER DATA FOR THE STATE OF IOWA, FEBRUARY, 1932

Station	River	Flood stage, feet	Average stage, feet	Monthly mean stage, feet	Departure from average, feet	Highest stage, feet	Date	Lowest stage, feet	Data
Lansing.....	Mississippi.....	18							
Dubuque.....	Mississippi.....	18	4.0	5.9	+ 1.9	7.4	18	4.3	1
Clinton.....	Mississippi.....	16		5.4		6.0	1†	4.5	26†
Le Claire.....	Mississippi.....	10		2.5		3.6	22	1.5	2†
Davenport.....	Mississippi.....	15	4.7	3.7	- 1.0	5.5	23	1.6	4
Muscatine.....	Mississippi.....	16		4.7		6.1	23	2.6	4
Keokuk.....	Mississippi.....	14	3.9	3.6	- 0.3	6.9	12	1.2	7
Cedar Rapids.....	Cedar.....	14		4.3		4.8	16	3.9	6†
Wapello.....	Iowa.....	11		3.1		3.9	21	2.0	3
Boone.....	Des Moines.....	20							
Des Moines.....	Des Moines.....	27	2.9	4.0	+ 1.1	9.7	29	2.8	2
Tracy.....	Des Moines.....	14							
Ottumwa.....	Des Moines.....	9		1.6		6.7	29	2.9	5
Van Meter.....	Raccoon.....	13		6.4		11.5	29	4.5	19
Hamburg (above)....	Nishnabotna.....	18		9.7		13.8	26	6.8	1
Sioux City.....	Missouri.....	17	6.6	5.2	- 1.4	6.7	29	4.5	19†
Omaha, Neb.....	Missouri.....	19	8.0	6.2	- 1.8	7.0	29	5.5	24

†And other dates.

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