U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU
IN COOPERATION WITH UNIVERSITY OF WYOMING #
CLIMATOGRAPHY OF THE UNITED STATES NO. 20 — 48

CLIMATOLOGICAL SUMMARY

LATITUDE 42° 44'
LONGITUDE 110° 56'
ELEV. (GROUND) 6210 Feet

STATION AFTON, WYOMING

MEANS AND EXTREMES FOR PERIOD 1931 - 1960

Month	Temperature (°F) Means: Daily maximum	Daily minimum	Monthly	Extremes: Record highest	Year	Record lowest	Year	** Mean degree days	Precipitation Totals (Inches): Mean	Greatest daily	Year	Snow, Sleet: Mean	Maximum monthly	Year	Greatest daily	Year	Mean number of days: Precip. .10 inch or more	Temperatures Max.: 90° and above	32° and below	Min.: 32° and below	0° and below	Month
(a)	30	30	30	30		30		30	30	30		30	30		30		30	30	30	30	30	
Jan.	25.7	0.9	13.3	49	1953	-52	1937	1603	1.53	0.86	1956	18.8	45.4	1940	10.0	1953+	6	0	21	31	15	Jan.
Feb.	31.7	3.9	17.8	56	1958	-48	1942+	1322	1.51	1.10	1937	18.3	45.7	1936	28.0	1937	5	0	14	28	11	Feb.
Mar.	38.9	10.7	24.8	63	1934	-31	1932	1246	1.55	1.25	1936	15.6	31.8	1936	18.0	1936	6	0	5	31	7	Mar.
Apr.	51.1	23.1	37.1	77	1946+	-20	1936	837	1.52	1.58	1939	8.6	25.5	1941	10.0	1951	5	0	*	27	*	Apr.
May	63.9	31.1	47.5	85	1954	14	1942+	543	1.95	1.13	1954	2.1	14.8	1942	6.0	1942	6	0	0	19	0	May
June	71.3	35.3	53.3	93	1940	20	1939+	357	1.96	1.44	1940	0.3	3.5	1943	4.0	1955	5	*	0	9	0	June
July	82.1	38.9	60.5	98	1934	23	1931	164	1.06	1.29	1955	0.0	0.0		0.0		3	3	0	4	0	July
Aug.	80.7	36.9	58.8	95	1940	22	1938	198	1.05	1.04	1932	0.0	0.0		0.0		3	1	0	8	0	Aug.
Sep.	72.7	30.7	51.7	92	1950	10	1936	399	1.16	1.41	1933	0.4	6.4	1934	5.0	1934	3	*	0	19	0	Sep.
Oct.	60.5	23.9	42.2	81	1933	-5	1935	707	1.53	1.66	1937	3.5	20.0	1946	9.0	1943	5	0	*	28	*	Oct.
Nov.	40.9	13.3	27.1	67	1954+	-30	1955	1137	1.52	1.00	1958	13.9	33.3	1942	12.0	1958	5	0	7	29	5	Nov.
Dec.	29.4	4.9	17.2	60	1939	-36	1945+	1482	1.59	1.67	1955	18.6	43.0	1948	12.0	1955+	5	0	18	31	11	Dec.
Year	54.1	21.1	37.6	98	July 1934	-52	Jan. 1937	9995	17.93	1.67	Dec. 1955	100.1	45.7	Feb. 1936	28.0	Feb. 1937	57	4	65	264	49	Year

(a) Average length of record, years.

T Trace, an amount too small to measure.

** Base 65°F; values computed from mean temperatures

\+ Also on earlier dates, months, or years.

* Less than one half.

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CLIMATE OF AFTON, WYOMING

Afton is located in the southern portion of Star Valley which is oriented north-south, roughly 10 to 15 miles wide and 45 miles long. The Salt River Range forms the eastern border of the Valley with peaks between 10 and 11 thousand feet elevation. The western border of the Valley is formed by mountains in Idaho, elevations in the neighborhood of 9000'. Salt River, a north flowing stream is about two miles to the west of Afton. Because of the surrounding mountains, winds are generally quite light. Cold airmasses from Canada seldom invade the Afton area as they are blocked out by the massive mountain ranges to the north and east. However, cold air can endure in the Valley as snow cover on the ground generally persists from late fall through spring, becoming deep enough to have a blanket effect on the ground such that frost seldom penetrates more than a few inches below the surface. Afton's climate is classified as: cold climate with humid winters.

Temperatures show a wide range between summer and winter, and between daily maximums and minimums. This is primarily due to the high elevation and dry air which permits rapid incoming and outgoing radiation, and also the passage of both warm and cold airmasses. Thus, Afton is subject to wide and sometimes abrupt changes in temperature and weather. Some temperature extremes not included in the 30-year period covered by the above table are maximums of 70° in January 1918, 69° in March 1913, 81° in April 1916, 86° in May 1919, 96° in June 1915, 93° in September 1967, 82° in October 1917, and 76° in November 1917. Also, minimums of -35° in March 1923, 4° in May 1919, 18° in July 1917, 16° in August 1910, 1° in September 1926, and the all-time minimum of -55° on December 19+, 1924.

Because of rapid nighttime radiation cooling, summertime freezes are not uncommon. Using July 25-26 (approximate top of annual temperature curve) as the dividing point between last season and next season, there was a 30-day average period of 32° freeze-free weather, ranging from 1 to 63 days, but with 32° occurrences scattered all through the summer period. Using the same dividing point for 28° analysis, the average last occurrence of 28° for the past season was June 24; while the average first occurrence of 28° for the next season was August 25, giving an average growing season for 28° of 62 days. Here again, however, there are no guarantees that 28° cannot be observed anywhere during the summer season, as, in 20% of the time the temperature would be expected to drop to 28° or lower after July 9 and likewise, in 20% of the time would the temperature be expected to drop to 28° or lower before August 12.

Precipitation is fairly even through the year with a peak in May and June and then dropping to a minimum in July, August and September. Normally, only about 11% (2.30") of the annual precipitation falls between the average 28° freeze-free dates. The greatest amount of precipitation measured in any one month was 6.50" during May 1906. In four months, no precipitation was noted. The greatest snowfall measured in any one month was 49.0" for January 1929. The greatest seasonal snowfall was 185.6" for 1961-1962 and the least was 73.2" for 1965-1966.

Sunshine is quite abundant in the Afton area, especially during the summer. There is no instrumental record of sunshine duration at Afton, but it is estimated to average about 60% of possible sunshine on an annual basis, ranging from about 40% in the winter to about 80% in the summer.

Relative humidities average comparatively low during the year and are estimated to average about 60% annually. They range from about 75% in December to about 45% in August. Daily ranges are estimated to average from 80% in early morning to 70% in the heat of the day during December, while during August, the range is estimated to be 65% to 25% for the same times.

Winds are generally quite light and variable, but during thunderstorms, gusts can occasionally reach the 80 to 100 mph range. Daytime winds are typically stronger than nighttime.

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Average Temperature (°F)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1931	12.4	17.9	24.4	38.2	45.8	56.4	61.7	59.8	50.0	42.2	23.5	10.8	36.9
1932	8.0	15.6	22.8	33.2	47.4	53.6	59.2	58.0	50.4	38.0	31.1	6.4	35.3
1933	18.2	9.7	23.9	31.3	42.8	57.8	62.8	58.4	52.6	44.8	32.5	25.7	38.4
1934	18.9	24.5	31.6	44.9	52.1	52.8	62.6	61.4	48.3	45.2	34.4	16.5	41.1
1935	9.7	14.1	23.9	35.1	43.0	52.6	59.0	55.3	52.8	40.1	20.6	9.2	34.6
1936	8.8	17.8	19.4	30.8	52.7	54.8	62.8	59.3	48.4	40.9	25.3	18.2	36.6
1937	4.0	15.3	22.8	29.8	48.1	51.6	61.4	58.4	52.0	41.6	29.1	18.0	36.0
1938	15.9	19.6	26.0	36.9	48.4	52.7	57.1	55.2	51.0	35.0	21.3	19.8	36.6
1939	24.6	16.6	27.3	46.2	48.4	51.6	60.8	59.0	52.8	42.2	31.8	25.8	40.6
1940	16.6	25.4	29.0	41.8	49.4	56.6	61.1	59.6	53.4	46.6	23.9	19.0	40.2
1941	10.8	18.0	23.9	37.4	49.0	53.1	60.0	59.1	48.4	41.2	28.6	20.8	41.0
1942	9.6	10.0	19.6	38.0	43.5	50.7	61.4	58.2	50.5	41.2	27.3	17.8	35.6
1943	15.5	15.0	21.1	44.0	45.8	50.6	59.2	58.6	53.2	43.8	30.2	14.0	37.6
1944	5.2	17.3	21.2	34.6	47.6	50.9	58.2	55.0	50.4	43.9	19.3	9.6	34.4
1945	13.0	21.2	22.2	30.6	46.7	49.6	60.5	59.3	47.6	43.0	22.2	13.4	35.8
1946	8.0	14.6	27.0	41.0	44.6	53.4	61.6	59.6	48.8	36.4	25.0	23.2	36.9
1947	8.6	19.6	28.2	37.2	49.2	50.0	60.0	57.9	52.6	45.1	23.7	16.2	37.4
1948	14.4	18.2	22.2	37.0	48.2	55.6	58.4	59.4	53.3	43.4	24.6	14.0	37.4
1949	2.8	17.0	30.6	41.7	49.5	53.0	59.5	60.3	51.1	37.3	37.1	19.9	38.3
1950	15.4	20.7	28.8	37.2	43.9	53.8	58.2	57.2	50.6	44.7	31.9	23.2	38.8
1951	15.5	21.5	22.5	37.5	48.9	49.9	60.8	58.7	51.2	40.5	23.0	16.1	37.2
1952	15.1	12.7	21.7	38.1	49.4	54.2	59.4	60.3	55.4	46.3	20.9	18.7	37.7
1953	28.4	20.9	29.2	35.6	44.4	54.4	61.9	61.3	55.0	44.8	37.1	16.5	40.8
1954	20.3	22.7	24.0	37.2	50.4	52.9	62.7	57.0	52.2	42.8	35.4	11.9	39.1
1955	11.6	14.0	20.5	32.8	47.4	52.3	60.7	60.4	51.7	42.5	26.8	20.2	36.7
1956	19.8	9.7	23.3	38.5	50.4	54.0	60.3	58.1	53.7	43.7	20.9	14.2	37.2
1957	8.3	24.0	28.1	35.9	47.4	54.2	60.1	60.1	53.1	41.9	22.9	20.2	38.0
1958	10.0	26.2	25.2	34.3	53.2	54.8	59.3	63.1	52.3	44.2	26.7	22.8	39.4
1959	18.8	20.3	25.8	39.2	43.5	57.6	60.5	58.5	52.4	42.1	30.0	20.9	39.2
1960	14.6	14.5	26.5	39.4	47.6	54.8	63.4	57.6	55.5	40.6	27.4	11.4	37.8
1961	9.0	25.5	26.9	36.0	47.9	57.6	62.8	62.5	46.7	38.2	20.6	14.4	37.3
1962	7.0	19.7	22.4	39.5	46.9	52.6	58.3	56.5	51.8	44.6	33.1	23.7	38.0
1963	12.0	30.0	28.8	34.8	49.2	54.2	62.5	61.8	56.0	48.0	30.5	16.9	40.4
1964	13.0	13.5	22.2	37.1	48.3	52.7	62.9	58.7	51.3	43.8	29.8	21.1	37.9
1965	22.1	19.7	19.3	40.4	45.8	53.3	60.5	58.4	46.0	45.0	33.6	16.2	38.4
1966	16.5	18.3	26.6	38.2	50.3	54.5	64.8	60.3	55.6	40.3	32.8	16.0	39.5
1967	24.9	22.1	29.2	35.9	45.5	53.3	62.5	61.9	55.5	42.9	31.8	17.2	40.2
1968	14.7	22.9	30.6	35.2	45.3	55.5	60.1	57.8	50.6	42.6	25.2	17.8	38.2

Total Precipitation (Inches)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann'l
1931	0.74	0.44	1.80	1.13	1.51	0.22	1.11	0.96	0.73	1.95	0.85	1.46	12.90
1932	1.34	2.10	2.51	2.17	1.04	2.93	1.20	1.58	0.05	0.79	0.87	1.28	17.86
1933	0.93	0.95	1.19	1.19	3.04	0.30	0.13	0.83	1.41	0.10	0.06	2.22	12.35
1934	0.78	1.40	1.50	1.10	0.31	1.18	0.99	0.32	1.37	1.97	2.04	1.49	14.45
1935	0.80	1.49	2.30	2.73	1.98	0.50	0.32	0.53	0.22	0.61	0.91	0.97	13.36
1936	2.65	2.76	2.18	0.12	1.09	2.11	2.04	1.89	1.17	1.12	0.23	1.13	18.49
1937	1.41	2.79	1.08	1.00	0.98	1.54	2.15	0.18	0.71	2.83	1.92	2.49	19.08
1938	1.35	1.65	2.48	1.28	1.47	2.62	2.98	1.00	0.30	0.72	1.91	0.96	18.72
1939	1.52	1.61	0.03	1.89	0.95	1.99	1.09	0.07	1.67	1.44	0.00	0.52	12.78
1940	2.67	1.44	1.03	2.15	0.92	1.70	0.55	0.40	2.98	4.16	1.47	1.23	20.70
1941	0.65	1.18	0.40	2.97	2.94	2.88	1.27	3.35	2.12	1.57	2.58	1.84	23.75
1942	1.12	1.10	0.45	1.69	2.92	2.45	0.59	0.34	0.52	0.78	4.02	1.59	17.57
1943	1.82	0.77	1.50	0.81	0.80	2.05	0.29	0.79	0.33	2.45	0.73	0.95	13.29
1944	1.12	1.05	1.36	1.61	2.16	4.76	0.19	0.00	0.81	0.70	2.34	1.33	17.43
1945	1.24	2.29	2.12	1.49	3.57	4.79	0.72	1.54	3.12	1.00	2.02	2.51	26.41
1946	1.06	0.89	1.51	0.74	2.34	0.76	0.56	1.14	1.55	3.74	1.08	1.05	16.42
1947	0.51	0.99	1.18	1.10	2.30	3.44	0.45	2.89	1.32	1.39	2.63	0.70	18.90
1948	1.16	0.85	1.40	2.41	1.83	4.16	0.29	0.42	0.65	1.06	1.92	3.49	19.64
1949	1.60	3.56	1.63	0.67	2.85	1.96	0.22	0.83	1.85	2.96	1.52	2.01	21.66
1950	2.91	1.28	2.33	1.33	2.00	1.97	2.11	0.00	2.45	1.53	2.82	1.49	22.22
1951	1.74	1.50	1.08	1.70	1.72	1.35	1.77	3.20	1.30	2.71	1.30	2.45	21.82
1952	2.73	1.70	2.01	1.62	1.87	1.27	1.78	1.82	1.10	0.00	0.93	0.98	17.81
1953	2.98	0.52	1.65	1.47	2.04	1.13	0.55	0.53	1.36	1.78	1.07	1.56	16.64
1954	1.62	0.63	2.94	0.37	2.07	2.52	1.18	0.68	0.27	1.12	1.70	1.20	16.30
1955	1.76	0.96	1.92	2.42	1.38	2.90	2.93	2.12	1.01	1.77	1.82	3.54	24.53
1956	2.30	0.89	0.80	1.48	2.25	1.38	0.29	0.43	0.52	1.75	0.62	1.58	14.29
1957	1.33	1.33	2.59	2.36	5.14	1.52	1.32	0.26	0.65	1.09	1.45	2.05	21.09
1958	1.72	2.64	1.08	1.06	1.65	0.77	1.60	0.77	1.07	0.17	2.37	1.78	16.68
1959	1.30	1.94	0.73	2.10	2.52	0.70	0.77	0.73	1.85	0.95	0.81	1.05	15.45
1960	1.30	2.61	1.15	1.36	0.74	0.99	0.40	1.90	0.29	1.59	2.92	0.75	16.00
1961	0.03	1.38	0.75	0.91	1.79	1.01	0.30	1.88	2.66	1.99	0.99	2.02	15.71
1962	1.60	2.24	0.89	2.01	3.38	1.29	1.41	0.78	0.30	1.46	0.59	0.37	16.32
1963	1.75	1.75	1.21	3.05	1.58	3.15	0.01	0.66	3.73	1.27	1.66	1.42	21.24
1964	1.41	0.75	1.63	1.91	1.56	5.38	1.27	0.56	0.45	0.36	1.27	4.06	20.61
1965	2.24	0.64	0.17	1.56	1.20	3.48	1.38	2.15	2.57	0.28	2.50	0.71	18.88
1966	0.56	1.08	0.85	1.06	2.16	1.65	0.44	0.42	1.97	0.58	1.14	1.30	13.21
1967	1.39	1.68	1.81	2.48	1.32	4.21	1.23	1.79	0.24	2.20	1.44	1.54	21.33
1968	0.78	1.62	1.43	1.27	1.95	2.30	0.12	2.53	1.41	0.65	2.14	1.86	18.06

STATION HISTORY

Records have been kept in the Afton area since March 1903. The station name changed from Afton to Grover in January 1947, to Gover 2S in September 1947, to Afton 2N in May 1957, and back to Afton in May of 1963. Most notable of many good observers was Clarence J. Hepworth who maintained the station from October 1920 to March 1943.

SHORT DURATION MAXIMUM RAINFALL INTENSITIES (in inches and tenths) FOR SELECTED RETURN PERIODS

Return Period (expected recurrence)	Duration of Precipitation: 30 min.	1 hour	2 hours	3 hours	6 hours	12 hours	24 hours	2 days	4 days	7 days	10 days
2 years	0.4	0.5	0.7	0.8	1.0	1.2	1.4	1.7	1.9	2.2	2.4
5 years	0.5	0.7	0.9	1.0	1.2	1.5	1.7	1.9	2.2	2.7	2.9
10 years	0.7	0.9	1.1	1.2	1.4	1.7	2.1	2.2	2.6	3.3	3.5
25 years	0.8	1.1	1.3	1.4	1.7	2.1	2.3	2.6	3.3	3.8	4.0
50 years	0.9	1.2	1.5	1.6	1.9	2.3	2.6	3.2	3.7	4.5	5.0

These values a[illegible]tracted from "Weather Bureau Technical Paper Nos. 40 and 49."

EVAPOTRANSPIRATION

Evapotranspiration, a combination of two words - evaporation and transpiration, is the combined processes by which water is transferred from the earth's surface to the atmosphere. P.E.T. is maximum potential evapotranspiration. P.E.T., 32° is potential evapotranspiration between the average 32° freeze-free dates. P.E.T., 28° is potential evapotranspiration between the average 28° freeze-free dates. P.-P.E.T. is normal monthly precipitation minus potential evapotranspiration. These values, in inches and hundredths, are computed values, based on C. W. Thornthwaite's method, using the Palmer-Havens graphical technique.

	J	F	M	A	M	J	J	A	S	O	N	D	Annual
P.E.T.	0.00	0.00	0.00	0.86	2.49	3.40	4.43	3.85	2.54	1.34	0.00	0.00	18.91
P.E.T., 32°	No dependable freeze-free period this level.												
P.E.T., 28°	0.00	0.00	0.00	0.00	0.00	0.68	4.43	3.10	0.00	0.00	0.00	0.00	8.21
P. - P.E.T.	+1.53	+1.51	+1.55	+0.66	-0.54	-1.44	-3.37	-2.80	-1.38	+0.19	+1.52	+1.59	-0.98