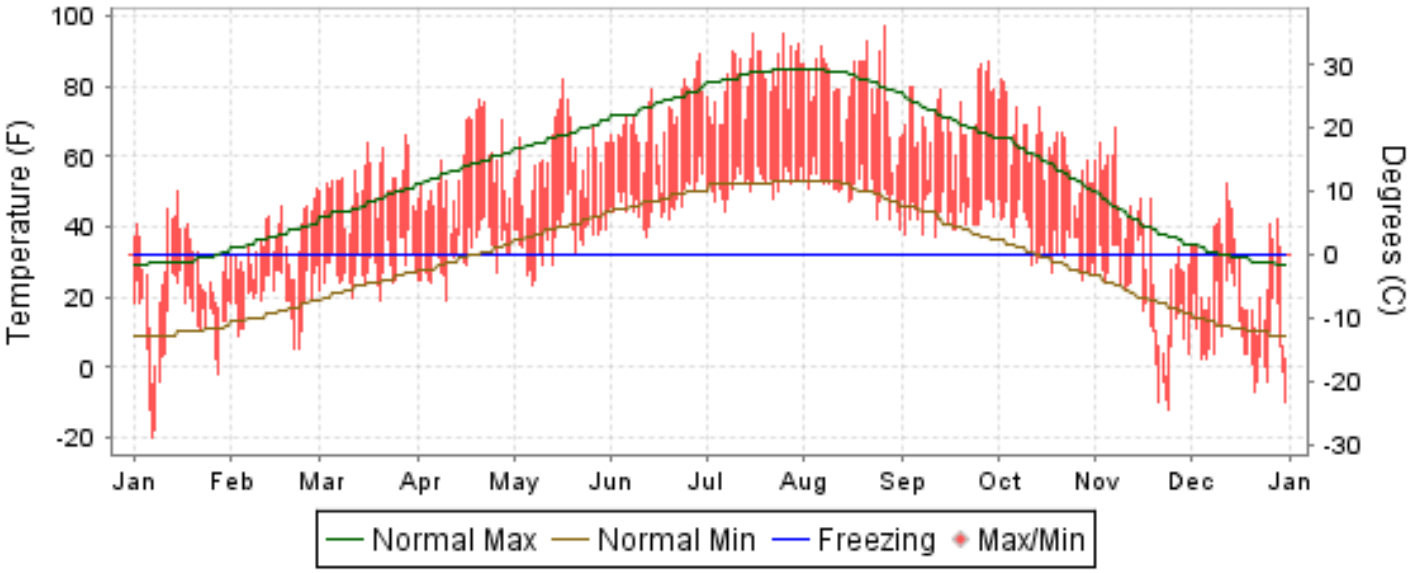
2010
LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA

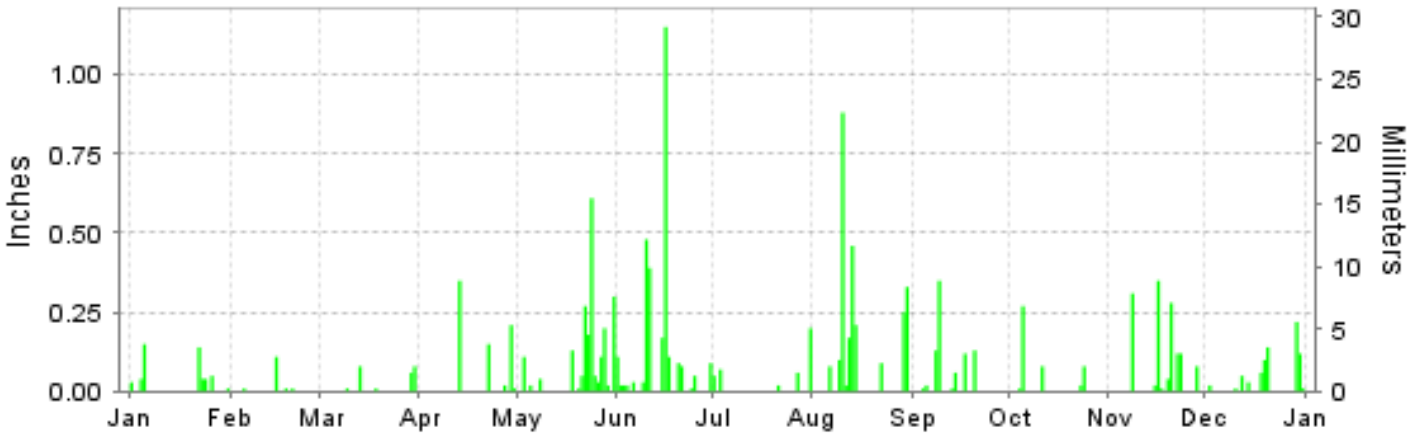
ISSN 0198-3024

HELENA,
MONTANA (KHLN)

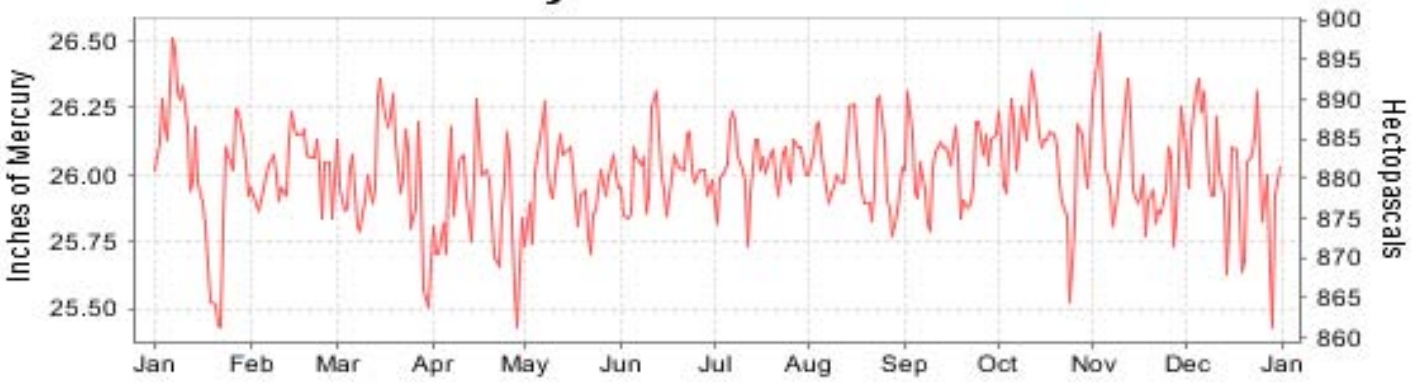
Daily Max/Min Temperature



Daily Precipitation



Daily Station Pressure



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Thomas R. Karl

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE	NATIONAL CLIMATIC DATA CENTER ASHEVILLE, NORTH CAROLINA	DIRECTOR NATIONAL CLIMATIC DATA CENTER

METEOROLOGICAL DATA FOR 2010
HELENA (KHLN)

LATITUDE: 46 ° 36'N **LONGITUDE:** -111° 57'W **ELEVATION (FT):** GRND: 3828 BARO: 3867 **TIME ZONE:** MOUNTAIN (UTC -7) **WBAN:** 24144

	ELEMENT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	MEAN DAILY MAXIMUM	28.2	35.8	52.0	56.1	59.6	70.8	82.6	79.5	70.6	62.8	37.0	27.3	55.2
	HIGHEST DAILY MAXIMUM	50	51	66	76	82	89	95	97	87	82	68	52	97
	DATE OF OCCURRENCE	15	28	28	20	17	29	25+	26	28	02	07	12	AUG 26
	MEAN DAILY MINIMUM	11.8	19.4	27.9	32.2	36.9	47.1	52.4	50.6	43.8	35.9	17.7	8.9	32.1
	LOWEST DAILY MINIMUM	-20	5	19	19	23	37	44	39	37	25	-12	-10	-20
	DATE OF OCCURRENCE	07	22+	20	10	07	12	07	31	11	28	24	31	JAN 07
	AVERAGE DRY BULB	20.0	27.6	40.0	44.2	48.3	59.0	67.5	65.1	57.2	49.4	27.4	18.1	43.7
	MEAN WET BULB	18.5	24.9	33.0	35.6	40.1	50.0	53.5	53.0	47.7	41.0	23.5	16.4	36.4
	MEAN DEW POINT	14.5	20.5	23.3	24.0	30.9	41.6	41.4	43.4	39.5	31.9	16.9	11.9	28.3
	NUMBER OF DAYS WITH:													
	MAXIMUM >= 90°	0	0	0	0	0	0	8	4	0	0	0	0	12
	MAXIMUM <= 32°	17	10	0	0	0	0	0	0	0	0	12	16	55
	MINIMUM <= 32°	31	28	26	16	7	0	0	0	0	12	24	31	175
	MINIMUM <= 0°	5	0	0	0	0	0	0	0	0	0	4	6	15
H/C	HEATING DEGREE DAYS	1386	1039	769	619	512	197	32	75	231	476	1121	1447	7904
	COOLING DEGREE DAYS	0	0	0	0	0	24	117	86	5	0	0	0	232
RH	MEAN (PERCENT)	78	76	56	50	56	57	44	52	57	56	67	77	61
	HOUR 05 LST	83	83	73	65	73	75	65	73	76	73	76	81	75
	HOUR 11 LST	74	72	45	36	42	43	32	40	44	43	57	73	50
	HOUR 17 LST	74	70	41	39	45	42	27	37	43	45	61	74	50
	HOUR 23 LST	82	80	64	58	64	66	53	60	65	64	71	79	67
S	PERCENT POSSIBLE SUNSHINE													
W/O	NUMBER OF DAYS WITH:													
	HEAVY FOG(VISBY <= 1/4 MI)	3	3	0	1	0	0	0	0	0	3	1	9	20
	THUNDERSTORMS	0	0	0	1	2	5	4	7	4	0	0	0	23
CLOUDNESS	SUNRISE-SUNSET: (OKTAS)													
	CEILOMETER (<= 12,000 FT.)													
	SATELLITE (> 12,000 FT.)													
	MIDNIGHT-MIDNIGHT: (OKTAS)													
	CEILOMETER (<= 12,000 FT.)													
	SATELLITE (> 12,000 FT.)													
	NUMBER OF DAYS WITH:													
	CLEAR													
	PARTLY CLOUDY													
	CLOUDY													
PR	MEAN STATION PRESS. (IN.)	26.02	26.02	26.00	25.89	25.97	26.02	26.03	26.02	26.04	26.07	26.03	26.00	26.01
	MEAN SEA-LEVEL PRESS. (IN.)	30.18	30.14	30.05	29.91	29.97	29.97	29.96	29.95	30.01	30.08	30.16	30.17	30.05
WINDS	RESULTANT SPEED (MPH)	1.8	2.1	3.9	5.8	4.5	3.0	4.1	2.8	3.4	4.0	4.8	1.9	3.5
	RES. DIR. (TENS OF DEGS.)	27	28	27	28	29	28	29	29	28	27	28	27	28
	MEAN SPEED (MPH)	2.9	3.0	6.3	8.9	8.1	6.7	6.9	5.9	5.7	5.4	5.8	3.4	5.8
	PREVAIL.DIR.(TENS OF DEGS.)	27	26	26	27	27	27	26	27	27	26	27	27	27
	MAXIMUM 2-MINUTE WIND													
	SPEED (MPH)	31	25	30	44	44	37	36	40	33	31	35	32	44
	DIR. (TENS OF DEGS.)	19	25	28	28	27	19	28	27	25	26	33	27	27
	DATE OF OCCURRENCE	15	13	26	08	03	29	12	10	20	25	16	10	MAY 03
	MAXIMUM 3-SECOND WIND:													
	SPEED (MPH)	39	32	45	53	61	49	46	53	46	41	38	43	61
	DIR. (TENS OF DEGS.)	19	27	25	28	28	18	28	27	23	26	29	26	28
	DATE OF OCCURRENCE	15	13	29	08	03	29	12	26	19	25	02	10	MAY 03
PRECIPITATION	WATER EQUIVALENT:													
	TOTAL (IN.)	0.50	0.14	0.24	0.74	2.13	2.85	0.40	2.59	0.83	0.46	1.33	0.76	12.97
	GREATEST 24-HOUR (IN.)	0.15	0.11	0.11	0.35	0.66	1.15	0.20	0.89	0.43	0.28	0.36	0.25	1.15
	DATE OF OCCURRENCE	05	15	29-30	13	24-25	16	31	10-11	08-09	04-05	16-17	29-30	JUN 16
	NUMBER OF DAYS WITH:													
	PRECIPITATION 0.01	8	4	5	5	15	16	5	10	8	5	9	10	100
	PRECIPITATION 0.10	2	1	0	3	8	6	1	7	4	1	5	4	42
	PRECIPITATION 1.00	0	0	0	0	0	1	0	0	0	0	0	0	1
SNOWFALL	SNOW,ICE PELLETS,HAIL	9.4	1.3	0.1	1.6	0.2	0.0	0.0	0.0	0.0	T	9.4	8.2	30.2
	TOTAL (IN.)	2.5	1.0	0.1	1.6	0.2	0.0	0.0	0.0	0.0	T	2.6	2.0	2.6
	GREATEST 24-HOUR (IN.)	05	15	09	13	05					25	28	29	NOV 28
	DATE OF OCCURRENCE	7	6	T	0	0	0	0	0	0	0	4	4	7
	MAXIMUM SNOW DEPTH (IN.)	24+	04+	10+								23	31	JAN 24+
	DATE OF OCCURRENCE													
	NUMBER OF DAYS WITH:													
	SNOWFALL >= 1.0	4	1	0	1	0	0	0	0	0	0	4	4	14

NORMALS, MEANS, AND EXTREMES
HELENA (KHLN)

LATITUDE: 46 ° 36'N **LONGITUDE:** -111° 57'W **ELEVATION (FT):** GRND: 3828 BARO: 3867 **TIME ZONE:** MOUNTAIN (UTC -7) **WBAN:** 24144

	ELEMENT	POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	30.5	37.3	46.8	56.9	65.9	75.0	83.4	82.5	71.0	58.4	41.5	31.5	56.7
	MEAN DAILY MAXIMUM	118	29.8	33.6	43.5	54.4	64.4	71.6	83.0	81.2	68.4	57.3	41.5	32.6	55.1
	HIGHEST DAILY MAXIMUM	70	72	69	78	86	93	100	105	105	99	87	75	64	105
	YEAR OF OCCURRENCE		2000	1995	2004	1992	2001	1988	2002	1969	1967	2001	1999	1980	JUL 2002
	MEAN OF EXTREME MAXS.	118	52.2	55.5	64.7	75.5	83.9	91.1	96.5	95.6	89.2	77.6	62.5	53.0	74.8
	NORMAL DAILY MINIMUM	30	9.9	15.6	23.5	31.2	39.8	47.5	52.3	50.8	41.2	31.2	20.3	11.3	31.2
	MEAN DAILY MINIMUM	118	11.4	15.0	22.5	31.3	40.4	47.0	53.6	51.8	41.9	33.4	22.2	14.7	32.1
	LOWEST DAILY MINIMUM	70	-42	-42	-30	1	17	30	36	28	18	-8	-39	-38	-42
	YEAR OF OCCURRENCE		1957	1996	1955	1954	1954	1999	1971	1992	1970	1991	1959	1964	FEB 1996
	MEAN OF EXTREME MINS.	118	-16.9	-7.8	0.7	16.8	27.9	36.3	43.3	40.8	28.6	15.7	-0.2	-12.1	14.4
	NORMAL DRY BULB	30	20.2	26.4	35.1	44.1	52.9	61.2	67.8	66.7	56.1	44.8	30.9	21.4	44.0
	MEAN DRY BULB	118	20.7	24.3	33.0	42.9	52.4	59.3	68.3	66.6	55.2	45.4	31.8	23.7	43.6
	MEAN WET BULB	27	18.3	21.7	28.1	35.1	42.6	49.5	53.2	51.9	45.0	36.4	26.0	17.9	35.5
	MEAN DEW POINT	27	15.3	17.2	23.2	29.3	36.9	44.0	46.7	45.5	39.3	30.9	22.0	14.7	30.4
	NORMAL NO. DAYS WITH:														
	MAXIMUM >= 90	30	0.0	0.0	0.0	0.0	0.2	2.4	7.7	7.2	1.2	0.0	0.0	0.0	18.7
	MAXIMUM <= 32	30	14.2	8.1	3.3	0.5	0.0	0.0	0.0	0.0	0.0	0.6	6.1	14.5	47.3
	MINIMUM <= 32	30	29.5	26.7	27.4	16.9	3.6	0.2	0.0	*	3.4	16.9	26.8	29.6	181.0
	MINIMUM <= 0	30	8.6	4.5	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.0	6.3	22.5
H/C	NORMAL HEATING DEG. DAYS	30	1397	1093	932	634	384	157	42	56	283	631	1018	1348	7975
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	3	39	122	100	13	0	0	0	277
RH	NORMAL (PERCENT)	30	71	67	62	55	55	54	48	49	54	60	67	71	59
	HOUR 05 LST	30	73	74	74	72	73	73	68	70	73	74	74	74	73
	HOUR 11 LST	30	68	63	54	46	45	44	40	42	47	53	63	68	53
	HOUR 17 LST	30	63	54	45	38	39	38	31	31	35	42	58	66	45
	HOUR 23 LST	30	72	70	67	60	61	59	53	54	59	64	70	73	64
S	PERCENT POSSIBLE SUNSHINE	55	47	56	61	59	61	64	78	75	68	60	44	42	60
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG(VISBY <= 1/4 MI)	47	2.2	1.2	1.0	0.6	0.3	0.1	0.1	0.2	0.3	0.6	1.1	2.5	10.2
	THUNDERSTORMS	63	0.0	0.0	0.1	0.9	3.6	6.9	7.7	7.2	1.7	0.3	0.1	0.0	28.5
CLOUDNESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)														
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH:														
	CLEAR	1	1.5	2.0	2.0			8.0	2.0	11.0	7.0	1.0		6.0	
	PARTLY CLOUDY	1	1.0	5.0	1.0		6.0	5.0	1.0	3.0	5.0	7.0		2.0	
	CLOUDY	1	3.0	3.0	12.0		23.0	6.0			4.0	7.0		3.0	
PR	MEAN STATION PRESSURE(IN)	27	26.03	26.01	25.98	25.98	25.98	26.00	26.05	26.05	26.06	26.05	26.03	26.04	26.02
	MEAN SEA-LEVEL PRES. (IN)	27	30.19	30.14	30.06	30.00	29.96	29.94	29.97	29.99	30.03	30.09	30.13	30.20	30.06
WINDS	MEAN SPEED (MPH)	27	5.9	6.4	7.5	8.3	8.2	8.0	7.3	6.7	6.6	6.7	6.4	5.7	7.0
	PREVAIL.DIR(TENS OF DEGS)	30	28	28	28	28	28	28	29	28	28	28	28	28	28
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	16	46	51	47	44	44	52	52	46	52	51	43	44	52
	DIR. (TENS OF DEGS)		29	26	28	28	27	18	24	26	26	28	25	28	24
	YEAR OF OCCURRENCE		1997	1999	2001	2010	2010	1999	2002	1999	1999	1999	2005	1995	JUL 2002
	MAXIMUM 3-SECOND														
	SPEED (MPH)	16	59	64	58	53	61	60	58	59	64	61	56	62	64
	DIR. (TENS OF DEGS)		28	26	26	28	28	19	25	26	26	26	27	26	26
	YEAR OF OCCURRENCE		2004	1999	2004	2010	2010	1999	2002	1999	1999	1999	2003	2008	SEP 1999
PRECIPITATION	NORMAL (IN)	30	0.52	0.38	0.63	0.91	1.78	1.82	1.34	1.29	1.05	0.66	0.48	0.46	11.32
	MAXIMUM MONTHLY (IN)	70	2.78	1.20	1.62	3.00	6.09	4.74	4.70	4.23	3.37	2.68	1.50	1.48	6.09
	YEAR OF OCCURRENCE		1969	1986	1982	1975	1981	1944	1993	1974	1965	1975	1950	1977	MAY 1981
	MINIMUM MONTHLY (IN)	70	T	0.02	0.02	0.10	0.29	0.08	.07	0.02	0.08	0.02	0.04	0.01	T
	YEAR OF OCCURRENCE		1987	1991	1959	1977	1979	1985	2005	1988	1972	1978	1969	2007	JAN 1987
	MAXIMUM IN 24 HOURS (IN)	70	0.77	0.58	1.01	1.57	2.31	1.78	2.26	1.86	1.61	1.01	0.82	0.51	2.31
	YEAR OF OCCURRENCE		1969	1953	1957	2006	1981	1979	1983	1974	1980	2000	1959	1982	MAY 1981
	NORMAL NO. DAYS WITH:														
	PRECIPITATION >= 0.01	30	7.5	6.3	8.1	8.6	11.4	10.4	8.1	7.7	6.3	5.7	6.7	7.3	94.1
	PRECIPITATION >= 1.00	30	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.5
SNOWFALL	NORMAL (IN)	30	8.2	5.7	6.8	4.6	0.9	0.*	0.*	0.3	1.2	2.8	5.4	7.4	43.3
	MAXIMUM MONTHLY (IN)	63	35.6	19.7	21.6	20.6	12.7	2.7	T	6.2	13.7	11.0	32.9	22.8	35.6
	YEAR OF OCCURRENCE		1969	1959	1955	1967	1967	1969	1993	1992	1965	1969	1959	1967	JAN 1969
	MAXIMUM IN 24 HOURS (IN)	63	11.5	11.7	8.7	12.9	12.5	2.7	T	6.2	13.3	7.4	21.5	10.7	21.5
	YEAR OF OCCURRENCE'		1969	1993	1955	1960	1967	1969	1993	1992	1957	1969	1959	1991	NOV 1959
	MAXIMUM SNOW DEPTH (IN)	52	23	15	15	8	8	T	0	0	10	6	19	14	23
	YEAR OF OCCURRENCE		1969	1975	1969	1986	1967	1969			1965	1969	1978	1985	JAN 1969
	NORMAL NO. DAYS WITH:														
	SNOWFALL >= 1.0	30	2.7	1.7	2.1	1.4	0.3	0.0	0.0	0.1	0.4	1.0	1.6	2.0	13.3

PRECIPITATION (inches) 2010 HELENA (KHLN)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1981	0.15	0.10	1.10	0.75	6.09	1.15	1.78	0.10	0.90	0.82	0.54	0.33	13.81
1982	0.80	0.58	1.62	0.54	1.77	2.99	0.49	0.74	2.74	0.35	0.31	1.05	13.98
1983	0.24	0.07	0.36	0.29	1.79	2.20	3.48	2.67	1.56	0.35	0.26	0.76	14.03
1984	0.17	0.15	0.49	1.45	1.03	2.14	0.11	1.11	0.73	0.74	0.47	0.41	9.00
1985	0.16	0.38	0.32	0.46	0.75	0.08	0.10	2.64	2.11	0.76	0.84	0.35	8.95
1986	0.32	1.20	0.49	1.08	0.83	1.56	1.37	1.84	2.45	0.03	0.54	0.38	12.09
1987	T	0.03	1.19	0.76	1.90	1.50	2.88	0.38	0.80	0.05	0.12	0.42	10.03
1988	0.27	0.50	0.45	1.32	1.82	1.50	0.36	0.02	2.09	0.69	0.69	0.32	10.03
1989	1.42	0.82	1.35	0.72	1.00	1.43	1.55	1.61	1.31	0.54	0.26	0.48	12.49
1990	0.47	0.14	0.91	0.43	1.54	0.92	0.40	2.57	0.11	0.11	0.36	0.47	8.43
1991	0.27	0.02	0.90	0.75	1.71	3.27	0.72	0.70	1.26	0.65	0.88	0.79	11.92
1992	0.29	0.10	0.60	0.55	0.64	2.36	1.06	1.01	0.09	1.87	0.19	0.57	9.33
1993	0.80	1.03	0.56	1.63	1.71	3.14	4.70	2.79	1.25	0.71	0.36	0.13	18.81
1994	0.20	0.40	0.32	1.45	1.23	0.84	0.71	0.47	0.09	1.14	0.55	0.07	7.47
1995	0.20	0.08	0.49	1.15	3.09	2.93	1.51	0.33	1.59	0.10	0.62	0.28	12.37
1996	0.55	0.11	0.58	0.70	2.42	1.20	1.27	0.89	0.51	0.04	0.84	0.61	9.72
1997	0.28	0.10	0.10	0.20	2.35	2.43	1.25	1.79	0.31	1.62	0.13	0.01	10.57
1998	0.49	0.12	0.39	0.64	2.27	3.03	2.96	0.50	0.82	0.14	1.07	0.14	12.57
1999	0.38	0.26	0.02	1.05	2.19	2.15	0.41	1.92	0.54	0.39	0.13	0.10	9.54
2000	0.26	0.32	0.26	0.73	0.98	1.42	0.73	0.43	0.54	2.12	0.36	0.23	8.38
2001	0.27	0.17	0.44	1.39	1.23	2.11	1.94	0.43	1.38	0.54	0.13	0.28	10.31
2002	0.04	0.29	0.52	0.61	1.86	4.36	1.61	1.32	1.22	0.16	0.50	0.05	12.54
2003	0.41	0.29	0.74	2.27	1.25	1.49	0.23	1.03	0.74	0.34	0.20	0.35	9.34
2004	0.26	0.17	0.37	1.82	2.21	1.07	0.68	2.84	1.76	0.41	0.10	0.36	12.05
2005	0.26	0.06	0.86	0.90	2.11	4.55	0.07	0.29	0.72	0.94	0.77	0.63	12.16
2006	0.22	0.24	0.60	2.95	1.77	2.69	0.39	0.25	1.17	1.32	0.55	0.38	12.53
2007	0.09	0.63	0.14	0.82	3.25	1.44	0.31	0.39	1.69	0.96	0.63	0.01	10.36
2008	0.49	0.31	0.12	0.49	2.62	1.58	0.47	0.45	0.70	0.38	0.86	0.77	9.24
2009	0.40	0.22	1.17	0.60	0.43	1.45	1.82	1.86	0.97	0.89	0.13	0.31	10.25
2010	0.50	0.14	0.24	0.74	2.13	2.85	0.40	2.59	0.83	0.46	1.33	0.76	12.97
POR= 118 YRS	0.60	0.46	0.72	0.99	1.92	2.12	1.10	1.00	1.11	0.73	0.63	0.59	11.97

WBAN : 24144

AVERAGE TEMPERATURE (°F) 2010 HELENA (KHLN)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1981	28.4	29.7	38.0	46.4	52.8	58.9	67.7	69.5	58.8	43.8	36.4	25.3	46.3
1982	16.5	23.7	33.9	40.5	50.9	61.2	68.6	69.1	55.5	44.9	27.4	22.7	42.9
1983	30.6	35.3	38.3	43.1	51.5	60.2	66.0	70.8	53.5	46.0	34.7	5.5	44.6
1984	27.3	32.4	37.2	43.5	52.8	60.0	70.0	69.8	52.3	41.7	33.1	11.6	44.3
1985	12.3	18.8	33.4	46.9	56.2	63.3	75.0	63.1	49.6	42.3	12.6	15.0	40.7
1986	25.5	21.8	42.9	43.3	53.6	66.4	64.2	68.0	51.2	45.3	29.0	18.6	44.2
1987	23.3	31.9	37.0	50.2	55.9	64.4	66.2	62.8	59.9	46.8	34.7	24.7	46.5
1988	18.8	29.1	36.1	47.1	55.5	68.4	71.3	68.6	56.4	50.3	33.8	23.1	46.5
1989	24.5	6.1	27.6	44.5	51.7	62.2	72.0	64.3	55.6	45.1	36.8	23.8	42.9
1990	28.8	26.9	34.9	45.8	51.0	61.5	69.4	68.4	63.6	45.3	37.4	14.0	45.6
1991	19.0	37.5	35.3	43.8	52.8	59.5	70.8	72.8	58.4	43.3	29.8	22.9	45.5
1992	23.7	34.2	42.7	47.7	57.5	64.9	64.3	64.7	56.7	46.7	32.8	14.7	45.9
1993	12.3	15.0	36.4	44.3	57.3	58.5	59.5	61.5	54.0	43.8	26.8	30.0	41.6
1994	29.8	20.7	39.4	45.6	56.2	62.7	69.0	69.9	61.6	44.3	28.3	23.6	45.9
1995	22.7	30.5	30.7	42.0	49.7	57.4	65.8	65.2	55.7	42.8	34.3	22.7	43.3
1996	9.9	21.1	25.7		48.2	61.3	68.3	66.6	55.5	43.8	23.1	16.6	
1997	13.3	28.2	36.9	38.4	53.2	60.1	65.8	65.4	58.8	44.1	31.2	24.4	43.3
1998	21.2	31.0	32.8	44.8	53.9	55.1	69.8	68.6	61.9	43.8	34.5	24.5	45.2
1999	26.8	32.4	37.1	40.8	50.2	58.8	65.3	68.4	52.9	45.8	39.2	28.1	45.5
2000	25.0	28.8	38.6	47.0	54.9	62.4	72.1	69.6	56.4	44.6	22.0	16.2	44.8
2001	20.1	17.6	35.4	44.0	59.2	64.1	72.0	74.7	64.6	48.4	39.2	24.5	47.0
2002	29.6	30.3	25.2	43.0	53.4	62.8	72.4	64.0	59.1	40.4	34.6	28.1	45.2
2003	29.4	25.3	34.2	46.0	53.3	63.2	76.4	73.5	59.3	50.6	28.8	28.3	47.4
2004	15.0	29.0	43.0	47.6	51.8	60.8	70.7	66.4	56.3	46.0	35.3	29.5	46.0
2005	16.5	31.3	37.1	44.9	52.4	59.8	72.5	68.6	58.0	49.1	34.6	19.9	45.4
2006	36.0	29.0	35.5	47.8	56.7	65.0	75.4	69.3	59.2	44.0	32.8	27.0	48.1
2007	25.6	27.4	43.1	46.0	56.2	65.6	78.8	69.7	58.3	47.6	34.4	27.8	48.4
2008	20.3	29.9	36.2	40.7	54.0	61.8	71.9	69.7	56.8	45.7	40.4	20.0	45.6
2009	27.4	32.3	31.0	42.3	55.4	60.3	69.4	68.5	64.1	40.2	36.7	10.8	44.9
2010	20.0	27.6	40.0	44.2	48.3	59.0	67.5	65.1	57.2	49.4	27.4	18.1	43.7
POR= 118 YRS	20.7	24.3	33.0	42.9	52.4	59.3	68.3	66.6	55.2	45.4	31.8	23.7	43.6

HEATING DEGREE DAYS (base 65°F) 2010 HELENA (KHLN)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1981-82	21	16	195	650	853	1227	1497	1153	959	726	428	136	7861
1982-83	30	16	304	618	1120	1306	1059	828	823	649	417	152	7322
1983-84	76	0	351	584	901	1842	1164	941	856	640	380	174	7909
1984-85	2	7	377	716	954	1654	1625	1291	973	538	266	97	8500
1985-86	3	105	455	696	1571	1545	1218	1202	677	645	380	42	8539
1986-87	66	23	409	602	1077	1432	1288	923	862	437	276	77	7472
1987-88	75	104	163	556	901	1241	1426	1034	889	529	297	63	7278
1988-89	10	13	282	449	934	1292	1251	1650	1156	610	407	107	8161
1989-90	0	92	274	611	839	1268	1116	1058	925	573	426	177	7359
1990-91	15	31	78	604	823	1579	1420	767	914	630	373	159	7393
1991-92	2	0	220	666	1053	1297	1273	884	687	513	237	94	6926
1992-93	68	141	246	564	960	1552	1631	1397	879	617	228	214	8497
1993-94	179	122	323	652	1139	1080	1080	1236	783	576	268	128	7566
1994-95	18	17	110	633	1095	1275	1307	963	1059	681	465	222	7845
1995-96	37	61	293	683	912	1303	1703	1268	1210		510	127	
1996-97	15	53	286	651	1251	1494	1596	1026	865	793	361	152	8543
1997-98	49	53	189	642	1006	1252	1352	942	990	600	336	293	7704
1998-99	2	8	158	650	909	1248	1176	905	859	718	451	188	7272
1999-00	79	20	354	590	767	1136	1232	1043	814	535	308	119	6997
2000-01	16	13	279	625	1283	1504	1385	1319	912	625	212	113	8286
2001-02	11	0	66	511	766	1249	1093	968	1229	652	366	126	7037
2002-03	1	52	201	755	904	1138	1096	1104	951	562	389	113	7266
2003-04	0	8	208	442	1081	1128	1542	1038	675	513	401	151	7187
2004-05	8	53	264	581	883	1093	1499	939	860	600	382	177	7339
2005-06	7	46	223	487	906	1395	892	1004	907	507	282	61	6717
2006-07	0	20	202	644	959	1171	1215	1045	673	566	274	69	6838
2007-08	0	15	236	529	911	1145	1378	1010	885	726	351	158	7344
2008-09	0	32	239	592	732	1387	1164	909	1047	675	310	167	7254
2009-10	17	34	101	763	843	1673	1386	1039	769	619	512	197	7953
2010-	32	75	231	476	1121	1447							

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COOLING DEGREE DAYS (base 65°F) 2010 HELENA (KHLN)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1981	0	0	0	0	0	15	109	165	16	0	0	0	305
1982	0	0	0	0	0	30	147	151	25	0	0	0	353
1983	0	0	0	0	4	16	115	186	12	0	0	0	333
1984	0	0	0	0	10	31	165	163	4	0	0	0	373
1985	0	0	0	0	2	55	318	54	0	0	0	0	429
1986	0	0	0	0	35	91	45	123	1	0	0	0	295
1987	0	0	0	0	3	66	122	41	15	0	0	0	247
1988	0	0	0	0	8	170	211	132	30	0	0	0	551
1989	0	0	0	0	0	30	222	82	0	0	0	0	334
1990	0	0	0	0	0	77	159	142	42	0	0	0	420
1991	0	0	0	0	0	2	188	250	29	0	0	0	469
1992	0	0	0	0	10	96	55	140	3	0	0	0	304
1993	0	0	0	0	2	24	15	23	0	0	0	0	64
1994	0	0	0	0	1	67	146	176	16	0	0	0	406
1995	0	0	0	0	0	5	71	73	24	0	0	0	173
1996	0	0	0		0	25	125	109	9	0	0	0	
1997	0	0	0	0	1	13	81	71	12	0	0	0	178
1998	0	0	0	0	0	0	161	124	72	0	0	0	357
1999	0	0	0	0	0	10	93	132	0	0	0	0	235
2000	0	0	0	0	2	50	245	165	27	0	0	0	489
2001	0	0	0	0	41	94	237	308	61	0	0	0	741
2002	0	0	0	0	15	71	238	29	30	0	0	0	383
2003	0	0	0	0	31	66	359	276	43	2	0	0	777
2004	0	0	0	0	0	31	191	102	10	0	0	0	334
2005	0	0	0	0	0	28	247	165	21	0	0	0	461
2006	0	0	0	0	31	69	332	163	33	0	0	0	628
2007	0	0	0	0	8	95	434	167	42	0	0	0	746
2008	0	0	0	0	18	69	220	183	0	0	0	0	490
2009	0	0	0	0	22	33	157	147	82	0	0	0	441
2010	0	0	0	0	0	24	117	86	5	0	0	0	232

SNOWFALL (inches) 2010 HELENA (KHLN)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1981-82	0.0	0.0	0.0	5.2	3.4	6.1	18.4	4.8	13.9	4.1	0.8	0.0	56.7
1982-83	0.0	0.0	6.5	0.5	4.1	11.3	3.2	0.2	2.2	1.1	9.9	0.0	39.0
1983-84	0.0	0.0	6.4	0.0	1.3	13.0	1.3	1.5	5.7	2.3	0.8	0.0	32.3
1984-85	0.0	0.0	6.3	9.0	5.7	7.5	3.9	6.2	4.0	0.8	0.0	0.0	43.4
1985-86	0.0	0.0	2.9	8.8	10.4	8.5	4.2	15.6	1.2	11.6	0.2	0.0	63.4
1986-87	0.0	0.0	0.0	T	7.6	5.0	0.2	0.2	9.1	4.3	3.8	0.0	30.2
1987-88	0.0	0.0	0.0	0.3	0.9	1.2	4.4	8.0	5.2	2.9	0.0	0.0	22.9
1988-89	0.0	0.0	5.9	1.5	6.0	5.0	23.0	13.0	20.7	7.9	3.5	T	86.5
1989-90	0.0	T	T	2.6	1.8	9.4	4.3	1.8	14.0	0.8	0.1	0.0	34.8
1990-91	0.0	0.5	0.0	0.5	8.6	11.6	5.9	0.8	12.2	5.6	0.4	0.5	46.6
1991-92	0.0	T	0.0	7.3	8.8	15.7	4.7	1.3	T	2.2	T	0.0	40.0
1992-93	T	6.2	T	8.6	1.5	11.8	10.2	17.9	2.3	2.5	T	0.2	61.2
1993-94	T	0.0	T	4.6	7.3	1.1	4.4	5.0	4.4	8.0	T	0.0	34.8
1994-95	0.0	T	0.0	T	8.6	2.0	0.3	1.6	8.1	0.0	0.0		
1995-96	T	0.0	T		7.4	2.7	14.2						
1996-97													
1997-98													
1998-99													
1999-00				T			3.9	5.7	2.3				
2000-01													
2001-02													
2002-03													
2003-04										4.8	T	0.0	
2004-05	0.0	0.0	T	T	1.3	6.7	11.2	0.4	10.9	T	0.0	0.0	30.5
2005-06	0.0	0.0	0.0	0.0	3.9	6.5	1.2	0.9	6.6	0.2	0.0	0.0	19.3
2006-07	0.0	0.0	0.0	1.2	6.1	0.4	1.7	8.8	0.3	0.3	0.0	0.0	18.8
2007-08	0.0	0.0	0.0	0.0	3.8	T	12.7	6.8	1.0	7.0	T	T	31.3
2008-09	0.0	0.0	0.0	1.2	0.2	15.9	5.7	4.7	8.3	5.7	0.0	0.2	41.9
2009-10	0.0	0.0	0.0	3.7	1.2	10.4	9.4	1.3	0.1	1.6	0.2	0.0	27.9
2010-	0.0	0.0	0.0	T	9.4	8.2							
POR= 116 YRS	T	0.1	1.1	2.9	6.6	8.2	9.8	7.5	8.3	4.8	1.5	0.1	50.9

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REFERENCE NOTES :

PAGE 1:
THE TEMPERATURE GRAPH SHOWS NORMAL MAXIMUM AND NORMAL MINIMUM DAILY TEMPERATURES (SOLID CURVES) AND THE ACTUAL DAILY HIGH AND LOW TEMPERATURES (VERTICAL BARS).

PAGE 2 AND 3:
H/C INDICATES HEATING AND COOLING DEGREE DAYS.
RH INDICATES RELATIVE HUMIDITY
W/O INDICATES WEATHER AND OBSTRUCTIONS
S INDICATES SUNSHINE.
PR INDICATES PRESSURE.
CLOUDINESS ON PAGE 3 IS THE SUM OF THE CEILOMETER AND SATELLITE DATA NOT TO EXCEED EIGHT EIGHTHS(OKTAS).

GENERAL:
T INDICATES TRACE PRECIPITATION, AN AMOUNT GREATER THAN ZERO BUT LESS THAN THE LOWEST REPORTABLE VALUE.
+ INDICATES THE VALUE ALSO OCCURS ON EARLIER DATES.
BLANK ENTRIES DENOTE MISSING OR UNREPORTED DATA.
NORMALS ARE 30-YEAR AVERAGES (1971 - 2000).
ASOS INDICATES AUTOMATED SURFACE OBSERVING SYSTEM.
PM INDICATES THE LAST DAY OF THE PREVIOUS MONTH.
POR (PERIOD OF RECORD) BEGINS WITH THE JANUARY DATA MONTH AND IS THE NUMBER OF YEARS USED TO COMPUTE THE MEAN. INDIVIDUAL MONTHS WITHIN THE POR MAY BE MISSING.
WHEN THE POR FOR A NORMAL IS LESS THAN 30 YEARS, THE NORMAL IS PROVISIONAL AND IS BASED ON THE NUMBER OF YEARS INDICATED.
0.* OR * INDICATES THE VALUE OR MEAN-DAYS-WITH IS BETWEEN 0.00 AND 0.05.
CLOUDINESS FOR ASOS STATIONS DIFFERS FROM THE NON-ASOS OBSERVATION TAKEN BY A HUMAN OBSERVER. ASOS STATION CLOUDINESS IS BASED ON TIME-AVERAGED CEILOMETER DATA FOR CLOUDS AT OR BELOW 12,000 FEET AND ON SATELLITE DATA FOR CLOUDS ABOVE 12,000 FEET.
THE NUMBER OF DAYS WITH CLEAR, PARTLY CLOUDY, AND CLOUDY CONDITIONS FOR ASOS STATIONS IS THE SUM OF THE CEILOMETER AND SATELLITE DATA FOR THE SUNRISE TO SUNSET PERIOD.
CLEAR INDICATES 0 - 2 OKTAS, PARTLY CLOUDY INDICATES 3 - 6 OKTAS, AND CLOUDY INDICATES 7 OR 8 OKTAS. WHEN AT LEAST ONE OF THE ELEMENTS (CEILOMETER OR SATELLITE) IS MISSING, THE DAILY CLOUDINESS IS NOT COMPUTED.

GENERAL CONTINUED:
WIND DIRECTION IS RECORDED IN TENS OF DEGREES (2 DIGITS) CLOCKWISE FROM TRUE NORTH. "00" INDICATES CALM. "36" INDICATES TRUE NORTH.
RESULTANT WIND IS THE VECTOR AVERAGE OF THE SPEED AND DIRECTION.
AVERAGE TEMPERATURE IS THE SUM OF THE MEAN DAILY MAXIMUM AND MINIMUM TEMPERATURE DIVIDED BY 2.
SNOWFALL DATA COMPRISE ALL FORMS OF FROZEN PRECIPITATION, INCLUDING HAIL.
A HEATING (COOLING) DEGREE DAY IS THE DIFFERENCE BETWEEN THE AVERAGE DAILY TEMPERATURE AND 65 F.
DRY BULB IS THE TEMPERATURE OF THE AMBIENT AIR.
DEW POINT IS THE TEMPERATURE TO WHICH THE AIR MUST BE COOLED TO ACHIEVE 100 PERCENT RELATIVE HUMIDITY.
WET BULB IS THE TEMPERATURE THE AIR WOULD HAVE IF THE MOISTURE CONTENT WAS INCREASED TO 100 PERCENT RELATIVE HUMIDITY.
ON JULY 1, 1996, THE NATIONAL WEATHER SERVICE BEGAN USING THE "METAR" OBSERVATION CODE THAT WAS ALREADY EMPLOYED BY MOST OTHER NATIONS OF THE WORLD. THE MOST NOTICEABLE DIFFERENCE IN THIS ANNUAL PUBLICATION WILL BE THE CHANGE IN UNITS FROM TENTHS TO EIGHTS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.
STATION HISTORY STOPPED WITH THE 2009 ANNUAL. IF YOU NEED HISTORY GO TO "MULTI-NETWORK MEDADATA SYSTEM", URL IS: https://mi3.ncdc.noaa.gov/mi3qry/login.cfm
SNOWFALL STOPPED MONTH & YEAR INDICATED ABOVE. NO FURTHER YEARS INCLUDED UNLESS RESTARTED.

NOTE:
The "Period of Record:(POR) for all "averages" is based on the "Summary of the Day First Order Station" and "Cooperative Summary of the Day" archives.

2010
HELENA
MONTANA (KHLN)

Helena is located on the south side of an intermountain valley bounded on the west and south by the main chain of the Continental Divide. The valley is approximately 25 miles in width from north to south and 35 miles long from east to west. The average height of the mountains above the valley floor is about 3,000 feet.

The climate of Helena may be described as modified continental. Several factors enter into modifying the continental climate characteristics. Some of these are invasion by Pacific Ocean air masses, drainage of cool air into the valley from the surrounding mountains, and the protecting mountain shield in all directions.

The mountains to the north and east sometimes deflect shallow masses of invading cold Arctic air to the east. Following periods of extreme cold, when the return circulation of maritime air has brought warming to most of the eastern part of the state, cold air may remain trapped in the valley for several days before being replaced by warmer air. During these periods of transition from cold-to-warm temperatures, inversions are often quite pronounced.

As may be expected in a northern latitude, cold waves may occur from November through February, with temperatures occasionally dropping to zero or lower.

Summertime temperatures are moderate, with maximum readings generally under 90 degrees and very seldom reaching 100 degrees. Like all mountain stations, there is usually a marked change in temperature from day to night. During the summer this tends to produce an agreeable combination of fairly warm days and cool nights.

Most of the precipitation falls from April through July from frequent showers or thunderstorms, but usually with some steady rains in June, the wettest month of the year. Like summer, fall and winter months are relatively dry. During the April to September growing season, precipitation varies considerably.

Thunderstorms are rather frequent from May through August. Snow can be expected from September through May, but amounts during the spring and fall are usually light, and snow on the ground ordinarily lasts only a day or two. During the winter months snow may remain on the ground for several weeks at a time. There is little drifting of snow in the valley, and blizzard conditions are very infrequent.

Severe ice, sleet, and hailstorms are very seldom observed. Since 1880, only a few hailstorms have caused extensive damage in the city of Helena.

In winter, hours of sunshine are more than would be expected at a mountain location.

Due to the sheltering influence of the mountains, Foehn (Chinook) winds are not as pronounced as might be expected for a location on the eastern slopes of the Rocky Mountains. Strong winds can occur at any time throughout the year, but generally do not last more than a few hours at a time.

Based on the 1951-1980 period, the average first occurrence of 32 degrees Fahrenheit in the fall is September 18 and the average last occurrence in the spring is May 18.

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