

1999

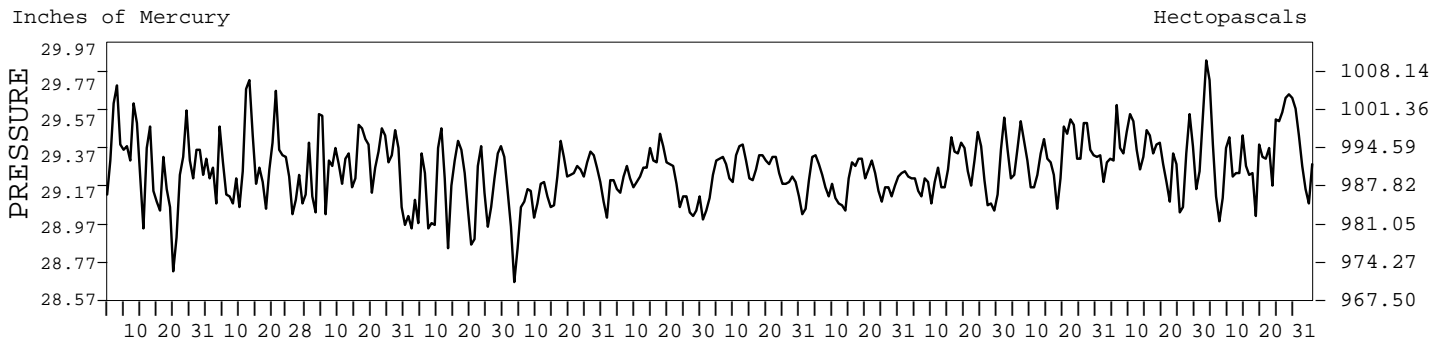
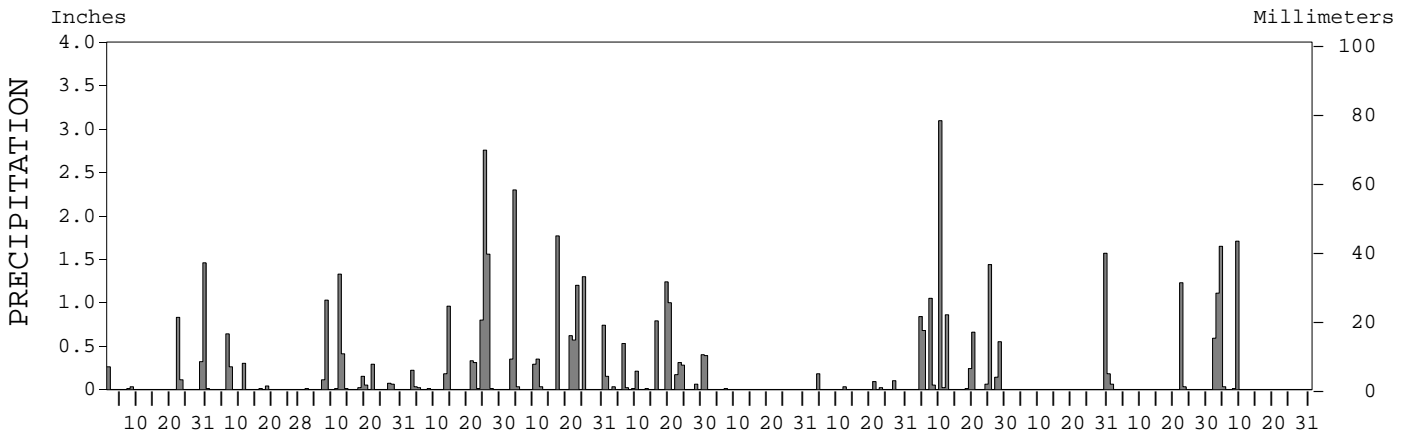
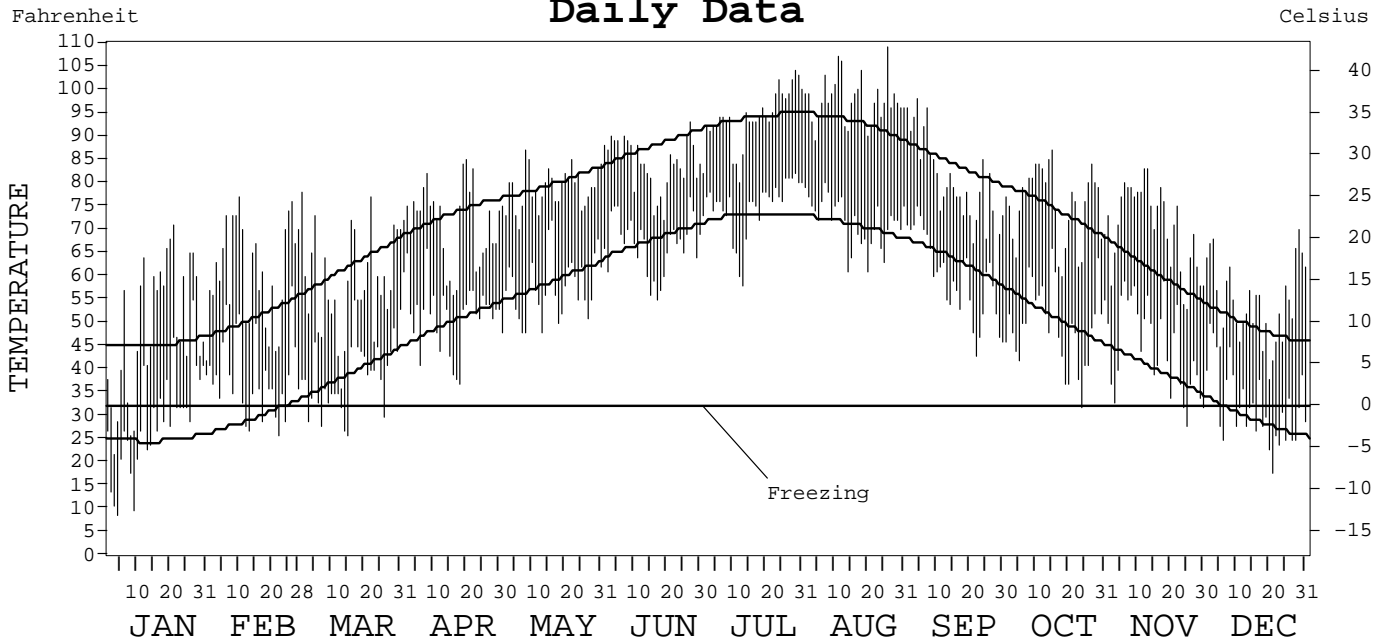
LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA



ISSN 0198-4071

TULSA,
OKLAHOMA (TUL)

Daily Data



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Thomas R. Karl

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	NATIONAL ENVIRONMENTAL AND INFORMATION SERVICE	NATIONAL SATELLITE, DATA, AND INFORMATION SERVICE	NATIONAL CLIMATIC DATA CENTER ASHEVILLE, NORTH CAROLINA	DIRECTOR NATIONAL CLIMATIC DATA CENTER
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METEOROLOGICAL DATA FOR 1999

TULSA, OK (TUL)

LATITUDE: 36° 11' 51" N LONGITUDE: 95° 53' 11" W ELEVATION (FT): GRND: 679 BARO: 679 TIME ZONE: CENTRAL (UTC + 6) WBAN: 13968

ELEMENT		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	48.8	61.6	58.8	71.2	78.7	84.1	93.9	97.5	80.0	75.1	70.4	54.5	72.9	
	HIGHEST DAILY MAXIMUM	71	77	78	85	87	93	104	109	98	87	83	70	109	
	DATE OF OCCURRENCE	21	10	01	20	08	27	29	26	04	15	13+	29	AUG 26	
	MEAN DAILY MINIMUM	29.2	38.4	38.7	51.7	57.4	66.7	74.8	71.6	59.6	49.5	44.9	32.3	51.2	
	LOWEST DAILY MINIMUM	9	26	26	37	48	55	58	61	43	32	28	18	9	
	DATE OF OCCURRENCE	04	22	15	18	13+	17	13	20+	22	24	25	21	JAN 04	
	AVERAGE DRY BULB	39.0	50.0	48.8	61.5	68.1	75.4	84.4	84.6	69.8	62.3	57.7	43.4	62.1	
	MEAN WET BULB	35.2	43.9	42.8	54.9	61.8		73.9	71.2	62.4	54.2	49.8	38.7		
	MEAN DEW POINT	29.9	36.3	35.4	48.6	57.0		69.1	64.6	57.7	47.2	41.9	31.4		
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	0	4	26	30	6	0	0	0	0	66
	MAXIMUM ≤ 32°	5	0	0	0	0	0	0	0	0	0	0	0	0	5
MINIMUM ≤ 32°	22	6	6	0	0	0	0	0	0	1	3	19	57		
MINIMUM ≤ 0°	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
H/C	HEATING DEGREE DAYS	798	415	496	134	18	0	0	0	38	130	238	664	2931	
	COOLING DEGREE DAYS	0	2	0	35	118	318	607	616	190	57	25	0	1968	
RH	MEAN (PERCENT)	74	63	65	67	70	77	62	55	70	62	60	65	66	
	HOUR 00 LST	79	70	69	75	78	84	70	64	79	70	68	70	73	
	HOUR 06 LST	81	77	79	81	88	90	81	79	86	80	78	78	82	
	HOUR 12 LST	67	51	57	58	58	66	51	42	58	48	46	54	55	
	HOUR 18 LST	65	52	54	54	56	67	48	38	56	49	47	57	54	
S	PERCENT POSSIBLE SUNSHINE	40													
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	0	1	0	1	0	1	0	0	0	1	0	0	4	
	THUNDERSTORMS	1	3	4	11	14	13	2	7	9	1	1	4	70	
CLOUDINESS	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.)	29.32	29.32	29.34	29.18	29.20	29.23	29.28	29.24	29.29	29.38	29.42	29.38	29.30	
	MEAN SEA-LEVEL PRESS. (IN.)	30.06		30.07	29.89	29.90	29.93			30.00	30.09	30.14	30.11		
WINDS	RESULTANT SPEED (MPH)	1.5	2.8	1.9	2.4	3.0	4.2	5.1	0.9	2.1	1.1	3.6	1.3	1.8	
	RES. DIR. (TENS OF DEGS.)	32	21	09	21	15	15	20	19	14	16	20	24	18	
	MEAN SPEED (MPH)	9.9	10.6	10.3	11.1	9.0	9.2	9.3	5.9	7.7	7.9	8.9	9.2	9.1	
	PREVAIL. DIR. (TENS OF DEGS.)	18	18	36	18	18	18	18	19	17	18	19	18	18	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	29	34	38	39	39	37	32	26	39	30	33	33	39	
	DIR. (TENS OF DEGS.)	32	29	26	15	15	03	19	14	27	18	27	28	27	
	DATE OF OCCURRENCE	02	11	08	13	10	24+	02	26	04	29+	22+	02	SEP 04	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	38	44	45	51	47	47	38	32	49	37	43	39	51	
DIR. (TENS OF DEGS.)	32	28	27	29	15	19	19	33	27	19	28	29	29		
	DATE OF OCCURRENCE	02	11	08	03	10	01	02	12	04	29	22	02	APR 03	
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	3.03	1.25	3.55	7.20	9.55	5.21	0.40	0.42	9.70	1.75	1.32	5.10	48.48	
	GREATEST 24-HOUR (IN.)	1.51	0.64	1.33	3.56	2.65	1.24	0.39	0.18	3.11	1.57	1.26	2.72	3.56	
	DATE OF OCCURRENCE	29-30	06	12	24-25	03-04	19	01	04	10-11	30	22-23	03-04	APR 24-25	
	NUMBER OF DAYS WITH:														
	PRECIPITATION ≥ 0.01	8	5	13	13	12	15	2	5	14	2	3	6	98	
PRECIPITATION ≥ 0.10	5	3	6	8	10	10	1	2	10	2	1	4	62		
	PRECIPITATION ≥ 1.00	1	0	2	2	4	2	0	3	1	1	3	19		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	3.3	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	9.2	
	GREATEST 24-HOUR (IN.)	2.8	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	5.8	
	DATE OF OCCURRENCE	22		13									02	MAR 13	
	MAXIMUM SNOW DEPTH (IN.)	2	0	5	0	0	0	0	0	0	0	0	0	5	
	DATE OF OCCURRENCE	23		14										MAR 14	
	NUMBER OF DAYS WITH:														
	SNOWFALL ≥ 1.0	1	0	1	0	0	0	0	0	0	0	0	0	2	

NORMALS, MEANS, AND EXTREMES

TULSA, OK (TUL)

LATITUDE: 36° 11' 51" N LONGITUDE: 95° 53' 11" W ELEVATION (FT): GRND: 679 BARO: 679 TIME ZONE: CENTRAL (UTC + 6) WBAN: 13968

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	45.4	51.0	62.1	73.0	79.7	87.7	93.7	92.5	83.6	73.8	60.3	48.8	71.0
	MEAN DAILY MAXIMUM	63	46.6	52.3	61.1	72.0	79.3	87.5	93.2	92.6	84.5	74.7	60.2	50.2	71.2
	HIGHEST DAILY MAXIMUM	60	79	90	96	102	96	103	112	110	109	98	87	80	112
	YEAR OF OCCURRENCE		1950	1996	1974	1972	1985	1953	1954	1970	1939	1979	1945	1966	JUL 1954
	MEAN OF EXTREME MAXS.	51	68.8	74.5	83.2	88.0	90.6	96.3	102.0	101.9	96.6	89.4	78.6	71.1	86.8
	NORMAL DAILY MINIMUM	30	24.9	29.5	39.1	49.9	58.8	67.7	72.8	70.6	63.0	50.7	39.5	28.9	49.6
	MEAN DAILY MINIMUM	63	26.4	30.6	38.4	49.5	58.7	67.5	72.1	70.4	62.3	50.8	38.6	30.0	49.6
	LOWEST DAILY MINIMUM	60	-8	-11	-3	22	35	49	51	52	35	18	10	-8	-11
	YEAR OF OCCURRENCE		1947	1996	1948	1957	1961	1954	1971	1988	1984	1993	1976	1989	FEB 1996
	MEAN OF EXTREME MINS.	51	6.7	12.2	20.1	33.3	44.4	55.7	62.2	59.3	46.5	34.3	22.2	11.5	34.0
	NORMAL DRY BULB	30	35.2	40.3	50.6	61.5	69.3	77.7	83.3	81.5	73.3	62.2	49.9	38.9	60.3
	MEAN DRY BULB	63	36.5	41.4	49.8	60.8	69.1	77.6	82.7	81.5	73.4	62.7	49.3	40.1	60.4
	MEAN WET BULB	53	32.1	36.4	43.3	52.8	62.2	69.8	72.6	71.1	65.0	54.8	43.6	35.5	53.3
	MEAN DEW POINT	53	25.6	29.4	35.6	46.0	57.9	66.1	68.3	66.6	60.4	49.1	37.2	29.1	47.6
	NORMAL NO. DAYS WITH:														
	MAXIMUM ≥ 90°	30	0.0	0.0	0.3	0.8	2.1	13.3	24.0	22.0	9.4	1.6	0.0	0.0	73.5
MAXIMUM ≤ 32°	30	5.8	2.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	3.1	12.0	
MINIMUM ≤ 32°	30	23.9	17.2	8.5	0.5	0.0	0.0	0.0	0.0	0.0	0.3	7.6	20.1	78.1	
MINIMUM ≤ 0°	30	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.1	
H/C	NORMAL HEATING DEG. DAYS	30	924	692	457	151	41	0	0	0	20	144	453	809	3691
	NORMAL COOLING DEG. DAYS	30	0	0	11	46	174	381	567	512	269	57	0	0	2017
RH	NORMAL (PERCENT)	30	67	65	62	61	69	69	64	64	70	66	67	68	66
	HOUR 00 LST	30	72	70	68	68	78	78	72	73	79	75	74	73	73
	HOUR 06 LST	30	78	77	76	78	85	86	82	84	86	82	80	79	81
	HOUR 12 LST	30	59	57	53	51	58	58	53	53	58	53	57	60	56
	HOUR 18 LST	30	58	55	49	48	56	56	49	50	57	55	59	61	54
S	PERCENT POSSIBLE SUNSHINE	53	54	55	58	59	59	69	76	74	68	65	56	53	62
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI) THUNDERSTORMS	60 60	2.1 0.7	1.6 1.3	0.9 3.3	0.2 6.1	0.4 8.7	0.3 8.3	0.2 5.7	0.1 6.0	0.6 5.1	1.1 3.1	1.2 1.6	1.7 0.9	10.4 50.8
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	1	6.4	5.6	5.2	6.0	5.2	2.8	3.2	2.7	5.6	3.5	4.8	4.0	4.6
	MIDNIGHT-MIDNIGHT (OKTAS)	1	6.4	5.6	6.4	6.0	4.8	2.4	2.8	2.8	4.0	3.5	4.8	4.8	4.5
	MEAN NO. DAYS WITH:														
CLEAR	3	5.0	8.3	8.0	9.5	9.7	10.7	13.5	15.0	7.5	10.0	7.0	9.0	113.2	
PARTLY CLOUDY	3	3.7	3.3	1.0	1.0	3.7	8.0	6.5	5.0	3.5	3.5	1.0	5.0	45.2	
CLOUDY	3	8.3	7.3	8.7	10.5	8.7	3.7	4.0	4.5	4.5	6.5	9.5	7.0	83.2	
PR	MEAN STATION PRESSURE (IN)	25	29.42	29.37	29.25	29.23	29.20	29.22	29.26	29.28	29.31	29.34	29.34	29.41	29.30
	MEAN SEA-LEVEL PRES. (IN)	53	30.15	30.10	29.99	29.95	29.93	29.92	29.96	29.98	30.00	30.05	30.08	30.13	30.02
WINDS	MEAN SPEED (MPH)	40	10.4	10.6	12.0	11.8	10.7	9.7	9.3	8.6	9.0	9.6	10.5	10.2	10.2
	PREVAIL. DIR (TENS OF DEGS)	26	18	18	18	18	18	18	18	18	18	18	18	18	18
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	7	37	39	46	55	39	49	51	32	39	36	44	33	55
	DIR. (TENS OF DEGS)		18	18	18	34	15	28	19	31	27	31	29	28	34
	YEAR OF OCCURRENCE		1996	1994	1997	1993	1999	1998	1993	1996	1999	1994	1998	1999	APR 1993
	MAXIMUM 5-SECOND:														
SPEED (MPH)	7	47	46	55	63	47	61	55	41	49	46	52	43	63	
DIR. (TENS OF DEGS)		19	25	16	34	15	28	19	31	27	30	29	32	34	
YEAR OF OCCURRENCE		1996	1993	1997	1993	1999	1998	1993	1996	1999	1994	1998	1997	APR 1993	
PRECIPITATION	NORMAL (IN)	30	1.54	1.97	3.46	3.72	5.60	4.44	3.09	3.12	4.70	3.66	3.13	2.16	40.59
	MAXIMUM MONTHLY (IN)	60	6.65	5.73	11.94	9.23	18.00	11.17	11.39	7.89	18.81	16.51	7.57	8.70	18.81
	YEAR OF OCCURRENCE		1949	1985	1973	1947	1943	1948	1994	1997	1971	1941	1946	1984	SEP 1971
	MINIMUM MONTHLY (IN)	60	0.00	0.16	0.08	0.34	1.17	0.53	0.03	0.21	T	T	0.01	0.10	0.00
	YEAR OF OCCURRENCE		1993	1996	1971	1989	1988	1963	1954	1945	1948	1952	1949	1996	JAN 1993
	MAXIMUM IN 24 HOURS (IN)	60	2.25	4.34	2.72	4.58	9.27	5.01	7.54	5.37	6.39	5.80	5.14	3.27	9.27
	YEAR OF OCCURRENCE		1946	1985	1998	1964	1984	1941	1963	1989	1940	1983	1974	1984	MAY 1984
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	6.1	6.7	8.4	8.8	10.1	8.5	5.9	6.8	8.0	6.5	6.5	6.7	89.0	
PRECIPITATION ≥ 1.00	30	0.2	0.4	1.1	1.0	1.6	1.3	0.9	1.1	1.5	1.3	1.0	0.6	12.0	
SNOWFALL	NORMAL (IN)	30	2.8	2.5	1.5	0.*	0.0	0.0	0.0	0.0	0.0	0.4	1.9	9.1	
	MAXIMUM MONTHLY (IN)	58	12.7	10.1	14.1	1.7	T	T	T	0.0	T	0.3	5.6	9.9	14.1
	YEAR OF OCCURRENCE		1979	1960	1994	1957	1991	1994	1994	1994	1990	1993	1972	1958	MAR 1994
	MAXIMUM IN 24 HOURS (IN)	58	9.0	6.5	12.9	1.7	T	T	T	0.0	T	0.3	4.0	8.8	12.9
	YEAR OF OCCURRENCE		1944	1993	1994	1957	1991	1994	1994	1994	1990	1993	1972	1954	MAR 1994
	MAXIMUM SNOW DEPTH (IN)	51	11	6	10	T	0	0	0	0	0	0	2	8	11
	YEAR OF OCCURRENCE		1988	1949	1968	1993							1971	1954	JAN 1988
NORMAL NO. DAYS WITH:															
SNOWFALL ≥ 1.0	30	1.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	3.2	

PRECIPITATION (inches) 1999 TULSA, OK (TUL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0.41	0.57	2.05	5.66	4.20	4.60	0.13	1.85	6.73	5.83	0.84	1.15	34.02
1971	1.37	4.18	0.08	1.37	6.59	3.27	3.34	1.86	18.81	7.99	1.21	6.34	56.41
1972	0.17	0.49	0.91	4.45	2.43	2.69	2.68	5.16	2.95	7.58	5.00	1.03	35.54
1973	3.39	0.74	11.94	7.22	5.30	7.69	6.47	4.70	6.56	6.16	6.32	3.39	69.88
1974	0.79	3.17	2.62	3.65	6.94	7.88	0.55	5.30	11.78	6.40	7.30	2.88	59.26
1975	2.61	3.44	5.45	2.20	7.22	6.75	2.14	3.52	3.34	1.47	3.53	3.04	44.71
1976	0.21	0.84	3.95	8.27	6.75	1.87	4.37	1.17	2.60	2.65	0.68	0.55	33.91
1977	1.43	1.57	5.58	2.05	5.72	6.69	2.00	4.86	5.57	2.75	2.31	0.93	41.46
1978	0.81	2.84	2.99	7.14	9.28	6.06	0.36	1.37	0.13	0.95	5.48	0.78	38.19
1979	2.07	0.81	3.97	4.47	6.15	8.90	2.68	4.77	0.28	2.20	5.60	0.45	42.35
1980	2.07	1.32	3.59	3.44	7.23	5.57	0.09	2.34	3.47	2.05	0.79	1.37	33.33
1981	0.69	1.63	1.67	1.90	6.70	3.31	6.22	2.47	3.11	6.73	2.25	0.20	36.88
1982	3.58	0.67	1.04	1.28	9.30	4.13	1.65	1.42	2.95	1.22	4.61	3.39	35.24
1983	2.95	1.98	2.19	3.88	6.85	1.47	0.58	0.65	2.11	9.33	2.14	0.61	34.74
1984	1.00	1.95	6.72	2.44	11.25	1.72	0.48	1.96	2.77	6.98	2.80	8.70	48.77
1985	1.24	5.74	5.39	5.62	4.19	7.63	2.38	1.91	3.29	6.26	6.27	1.39	51.31
1986	0.00	1.22	2.28	5.10	6.97	4.23	1.15	3.96	8.36	5.53	2.99	0.97	42.76
1987	2.21	4.72	2.20	0.70	10.02	2.31	4.20	3.72	3.52	1.27	5.17	5.87	45.91
1988	1.11	1.03	6.52	3.18	1.17	0.58	4.20	2.43	5.37	1.43	4.38	1.82	33.22
1989	2.94	2.26	3.14	0.34	3.95	5.16	4.09	6.69	3.32	2.80	0.15	0.26	35.10
1990	2.93	4.14	6.51	5.31	5.21	1.08	0.24	1.83	4.19	2.15	2.41	2.94	38.94
1991	1.47	0.38	1.02	2.58	5.11	3.64	0.35	1.17	6.15	5.12	1.98	4.57	33.54
1992	0.48	1.32	1.37	4.75	5.65	8.41	2.12	3.09	2.66	3.53	4.83	5.21	43.42
1993		2.86	2.76	4.59	6.86	3.79	2.42	2.29	6.90	1.13	1.69	1.76	
1994	0.68	2.21	3.35	6.57	2.81	2.73	11.39	4.12	3.60	3.68	7.10	1.21	49.45
1995	0.93	0.57	1.83	5.92	10.73	9.84	2.55	1.44	4.96	1.05	0.25	1.77	41.84
1996	0.47	0.16	2.07	1.40	2.14	3.64	3.22	1.34	5.04	5.60	7.16	0.10	32.34
1997	0.27	3.41	1.39	4.09	1.66	5.77	5.64	7.89	3.06	2.07	1.63	4.32	41.20
1998	3.49	0.30	7.30	4.54	2.52	3.36	4.31	1.67	5.13	9.14	3.26	1.58	46.60
1999	3.03	1.25	3.55	7.20	9.55	5.21	0.40	0.42	9.70	1.75	1.32	5.10	48.48
POR= 63 YRS	1.57	1.80	2.87	4.05	5.47	4.59	3.20	3.02	4.28	3.51	2.64	2.04	39.04

WBAN : 13968

AVERAGE TEMPERATURE (°F) 1999 TULSA, OK (TUL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	29.7	41.9	44.6	60.7	70.7	76.9	82.8	84.8	74.5	58.9	45.6	42.5	59.5
1971	36.5	39.0	49.9	60.2	66.7	79.4	80.0	79.0	73.0	65.0	50.1	43.7	60.2
1972	34.8	41.8	53.0	62.8	68.0	79.5	80.4	81.7	75.5	60.9	43.6	33.7	59.6
1973	34.0	39.8	54.3	58.2	67.5	76.7	81.2	79.3	72.3	65.0	53.4	38.1	60.0
1974	34.1	43.7	55.2	61.8	72.1	73.8	85.4	78.3	64.7	63.0	49.1	39.7	60.1
1975	39.9	36.9	45.3	60.4	69.1	76.0	81.2	82.2	69.2	63.2	50.8	40.1	59.5
1976	37.2	51.1	51.9	61.5	63.0	75.0	81.4	79.7	72.8	56.1	43.1	37.1	59.2
1977	26.9	46.6	55.0	64.4	72.6	81.0	84.8	81.7	75.6	62.2	51.1	39.0	61.7
1978	24.9	29.4	47.5	63.5	68.3	77.6	87.8	84.3	80.6	63.5	51.6	38.0	59.8
1979	23.1	30.2	52.4	61.0	68.7	77.8	83.4	81.8	74.7	66.2	47.5	44.4	59.3
1980	38.6	37.1	48.3	61.1	70.6	82.5	91.7	89.7	78.3	61.5	50.5	42.3	62.7
1981	37.6	43.6	53.3	68.0	65.9	80.0	85.9	79.4	73.9	60.9	51.4	38.5	61.5
1982	33.6	38.2	55.3	59.3	72.9	74.7	84.2	85.3	74.6	63.4	50.6	44.4	61.4
1983	39.1	42.9	49.0	55.4	67.0	76.6	84.7	88.1	77.4	64.5	52.9	26.7	60.4
1984	34.4	46.4	48.3	58.0	67.5	80.1	82.0	82.7	71.5	63.8	50.4	44.7	60.8
1985	30.2	35.9	54.7	63.3	70.6	75.8	82.9	81.7	74.6	63.1	47.8	34.5	59.6
1986	42.8	43.2	55.0	62.6	69.4	79.7	86.6	78.2	74.7	61.0	43.6	40.0	61.4
1987	36.0	45.4	51.5	63.2	74.1	78.9	81.9	83.1	72.4	59.3	51.6	41.4	61.6
1988	34.8	39.3	49.3	59.5	71.0	79.9	82.6	83.0	73.2	58.5	51.7	43.4	60.5
1989	43.4	31.9	49.3	63.3	69.2	74.8	80.2	80.4	68.7	64.0	52.7	31.6	59.1
1990	46.1	46.1	53.2	59.6	67.4	82.1	83.2	83.5	78.3	61.2	56.4	38.5	63.0
1991	34.7	48.3	55.1	63.8	73.7	80.0	84.9	82.9	72.7	64.3	45.8	44.6	62.6
1992	42.8	50.1	54.9	61.6	67.6	74.7	81.8	76.6	72.8	60.8	45.9	38.6	60.7
1993	35.7	37.8	46.8	55.8	66.0	76.8	84.4	83.5	68.6	56.2	44.5	42.3	58.2
1994	35.2	39.0	52.9	60.4	67.4	80.5	79.3	78.4	70.9	63.4	52.0	42.7	60.2
1995	39.4	44.2	51.5	58.3	65.5	74.1	82.3	84.6	70.5	62.8	48.8	39.4	60.1
1996	35.4	43.0	45.4	59.2	72.9	78.5	81.6	79.8	70.0	61.4	44.9	42.1	59.5
1997	35.9	44.1	52.4	55.9	66.9	75.5	81.7	78.3	73.9	62.0	46.0	39.3	59.3
1998	40.1	44.8	46.7	57.8	72.9	79.9	85.4	84.1	80.8	63.0	53.4	40.8	62.5
1999	39.0	50.0	48.8	61.5	68.1	75.4	84.4	84.6	69.8	62.3	57.7	43.4	62.1
POR= 64 YRS	36.6	41.5	49.8	60.8	69.0	77.5	82.6	81.6	73.3	62.7	49.3	40.1	60.4

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HEATING DEGREE DAYS (base 65°F) 1999 TULSA, OK (TUL)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	0	0	18	217	577	692	878	721	463	176	37	0	3779
1971-72	0	0	53	60	446	653	932	670	373	161	47	0	3395
1972-73	0	0	19	183	634	964	954	700	321	233	42	0	4050
1973-74	0	0	24	95	343	824	951	591	341	137	5	0	3311
1974-75	0	0	74	94	473	777	773	780	610	205	19	0	3805
1975-76	0	0	57	146	429	762	855	402	407	126	109	0	3293
1976-77	0	0	16	317	648	858	1173	511	309	99	1	0	3932
1977-78	0	0	1	118	412	801	1236	989	541	110	67	0	4275
1978-79	0	0	0	121	406	834	1293	972	391	164	47	0	4228
1979-80	0	0	0	90	525	632	812	801	513	154	22	0	3549
1980-81	0	0	13	172	438	703	843	598	360	48	58	0	3233
1981-82	0	0	23	178	402	817	967	747	322	208	11	5	3680
1982-83	0	0	23	146	437	635	794	611	492	321	50	0	3509
1983-84	0	0	19	89	378	1179	941	533	509	229	47	0	3924
1984-85	0	0	73	130	438	628	1073	809	330	103	7	0	3591
1985-86	0	0	46	111	510	936	680	602	322	127	13	0	3347
1986-87	0	0	5	148	632	771	893	544	413	149	0	0	3555
1987-88	0	0	1	189	416	727	928	739	483	187	9	0	3679
1988-89	0	0	8	218	393	662	663	921	487	155	53	0	3560
1989-90	0	0	67	126	375	1029	580	527	376	194	54	0	3328
1990-91	0	0	8	172	271	813	933	459	327	83	17	0	3083
1991-92	0	0	35	121	570	628	682	423	311	156	53	0	2979
1992-93	0	0	9	151	565	812	903	755	556	280	57	0	4088
1993-94	0	0	40	294	611	695	917	721	387	186	56	0	3907
1994-95	0	0	25	126	390	683	783	574	436	219	70	0	3306
1995-96	0	0	79	112	480	786	911	640	604	204	19	0	3835
1996-97	0	0	26	152	594	701	896	579	393	275	40	0	3656
1997-98	0	0	3	195	563	791	764	558	581	225	12	6	3698
1998-99	0	0	0	109	344	747	798	415	496	134	18	0	3061
1999-	0	0	38	130	238	664							

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COOLING DEGREE DAYS (base 65°F) 1999 TULSA, OK (TUL)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0	0	0	50	209	382	555	619	307	39	0	0	2161
1971	0	0	3	40	97	442	471	444	298	65	7	0	1867
1972	0	6	11	99	144	446	487	524	339	64	0	0	2120
1973	0	0	0	35	124	357	508	452	249	101	5	0	1831
1974	0	0	47	48	232	270	641	419	71	40	2	0	1770
1975	0	0	9	77	156	335	509	542	192	97	12	0	1929
1976	0	6	7	28	52	307	520	461	256	48	0	0	1685
1977	0	1	6	84	248	486	619	525	327	38	0	0	2334
1978	0	0	7	73	180	388	713	605	476	79	14	0	2535
1979	0	0	9	48	167	388	577	527	298	137	6	0	2157
1980	0	0	0	43	200	533	833	774	419	69	6	4	2881
1981	0	5	4	145	96	456	658	452	296	57	1	0	2170
1982	0	0	28	44	266	300	601	637	319	106	10	5	2316
1983	0	0	3	40	120	353	615	725	396	80	20	0	2352
1984	0	0	0	25	132	464	534	556	272	100	9	2	2094
1985	0	0	19	59	185	333	564	523	340	57	0	0	2080
1986	0	0	20	60	157	448	676	415	303	31	0	0	2110
1987	0	0	2	102	290	421	532	567	230	18	19	0	2181
1988	0	0	2	30	200	454	555	564	262	23	1	0	2091
1989	0	0	6	107	191	300	475	483	183	105	14	0	1864
1990	0	0	17	38	137	521	571	581	416	63	21	0	2365
1991	0	0	29	53	293	458	622	562	274	108	3	0	2402
1992	0	0	5	63	140	298	526	369	251	29	0	0	1681
1993	0	0	1	7	95	360	609	579	153	27	0	0	1831
1994	0	0	21	55	135	470	452	424	212	82	8	0	1859
1995	0	0	24	26	97	282	545	618	252	50	0	0	1894
1996	0	6	0	37	273	410	522	463	183	49	0	0	1943
1997	3	0	9	10	106	321	524	420	278	108	0	0	1779
1998	0	0	18	16	264	459	640	598	480	53	5	2	2535
1999	0	2	0	35	118	318	607	616	190	57	25	0	1968

SNOWFALL (inches) 1999 TULSA, OK (TUL)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	0.0	0.0	0.0	0.0	T	0.0	T	6.5	T	0.0	0.0	0.0	6.5
1971-72	0.0	0.0	0.0	0.0	2.0	1.0	0.8	4.9	T	0.0	0.0	0.0	8.7
1972-73	0.0	0.0	0.0	0.0	5.6	1.7	4.3	2.2	0.0	0.3	0.0	0.0	14.1
1973-74	0.0	0.0	0.0	0.0	T	1.8	T	T	T	T	0.0	0.0	1.8
1974-75	0.0	0.0	0.0	0.0	1.7	T	T	3.0	1.8	T	0.0	0.0	6.5
1975-76	0.0	0.0	0.0	0.0	0.8	1.3	T	T	T	0.0	0.0	0.0	2.1
1976-77	0.0	0.0	0.0	0.0	0.5	T	10.5	0.3	0.0	0.0	0.0	0.0	11.3
1977-78	0.0	0.0	0.0	0.0	T	0.0	5.4	6.3	T	0.0	0.0	0.0	11.7
1978-79	0.0	0.0	0.0	0.0	0.0	2.8	12.7	3.4	0.0	T	0.0	0.0	18.9
1979-80	0.0	0.0	0.0	0.0	T	0.0	0.4	3.8	T	0.0	0.0	0.0	4.2
1980-81	0.0	0.0	0.0	0.0	T	0.0	T	0.9	T	0.0	0.0	0.0	0.9
1981-82	0.0	0.0	0.0	0.0	0.0	T	0.3	5.6	T	0.0	0.0	0.0	5.9
1982-83	0.0	0.0	0.0	0.0	T	T	3.8	1.4	T	0.0	0.0	0.0	5.2
1983-84	0.0	0.0	0.0	0.0	T	3.0	4.6	0.2	T	0.0	0.0	0.0	7.8
1984-85	0.0	0.0	0.0	0.0	0.0	6.6	3.3	4.3	0.0	0.0	0.0	0.0	14.2
1985-86	0.0	0.0	0.0	0.0	T	2.5	0.0	4.9	0.0	0.0	0.0	0.0	7.4
1986-87	0.0	0.0	0.0	0.0	0.0	0.0	8.7	4.6	0.0	0.0	0.0	0.0	13.3
1987-88	0.0	0.0	0.0	0.0	T	6.7	11.0	T	0.5	0.0	0.0	0.0	18.2
1988-89	0.0	0.0	0.0	0.0	0.4	2.7	3.4	0.3	9.7	0.0	0.0	0.0	16.5
1989-90	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.2	0.0	0.0	0.0	2.2
1990-91	0.0	0.0	0.0	0.0	0.0	4.6	T	1.4	T	0.0	T	0.0	6.0
1991-92	0.0	0.0	0.0	0.0	0.2	0.1	0.8	0.0	T	T	0.0	0.0	1.1
1992-93	0.0	0.0	0.0	0.0	3.5	1.1	T	6.7	T	T	0.0	0.0	14.4
1993-94	0.0	0.0	0.0	0.3	0.0	0.0	T	T	14.1	T	0.0	T	14.4
1994-95	T	0.0	0.0	0.0	T	0.0	1.8	T	6.3	0.0	0.0	0.0	9.2
1995-96	0.0	0.0	0.0	0.0	1.8	1.0	5.0	0.0	0.0	0.0	0.0	0.0	9.2
1996-97	0.0	0.0	0.0	0.0	0.0	0.6	4.0	0.0	T	0.0	0.0	0.0	4.6
1997-98	T	0.0	0.0	0.0	T	0.6	4.0	0.0	T	0.0	0.0	0.0	4.6
1998-99	0.0	0.0	0.0	0.0	0.0	T	3.3	0.0	5.9	0.0	0.0	0.0	9.2
1999-	0.0	0.0	0.0	0.0	0.0	T	T	T	T	T	T	T	T
POR= 64 YRS	T	0.0	0.0	T	0.4	1.5	3.0	2.3	1.8	T	T	T	9.0

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REFERENCE NOTES:

<p>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).</p> <p>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).</p> <p>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 (1961 - 1990). 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.</p>	<p>GENERAL CONTINUED: 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. 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.</p> <p>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 EIGHTHS(OKTAS) FOR REPORTING THE AMOUNT OF SKY COVER.</p>
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1999
TULSA,
OKLAHOMA (TUL)

The city of Tulsa lies along the Arkansas River at an elevation of 700 feet above sea level. The surrounding terrain is gently rolling.

At latitude 36 degrees, Tulsa is far enough north to escape the long periods of heat in summer, yet far enough south to miss the extreme cold of winter. The influence of warm moist air from the Gulf of Mexico is often noted, due to the high humidity, but the climate is essentially continental characterized by rapid changes in temperature. Generally the winter months are mild. Temperatures occasionally fall below zero but only last a very short time. Temperatures of 100 degrees or higher are often experienced from late July to early September, but are usually accompanied by low relative humidity and a good southerly breeze. The fall season is long with a great number of pleasant, sunny days and cool, bracing nights.

Rainfall is ample for most agricultural pursuits and is distributed favorably throughout the year. Spring is the wettest season, having an abundance of rain in the form of showers and thunderstorms.

The steady rains of fall are a contrast to the spring and summer showers and provide a good supply of moisture and more ideal conditions for the growth of winter grains and pastures. The greatest amounts of snow are received in January and early March. The snow is usually light and only remains on the ground for brief periods.

The average date of the last 32 degree temperature occurrence is late March and the average date of the first 32 degree occurrence is early November. The average growing season is 216 days.

The Tulsa area is occasionally subjected to large hail and violent windstorms which occur mostly during spring and early summer, although occurrences have been noted throughout the year.

Prevailing surface winds are southerly during most of the year. Heavy fogs are infrequent. Sunshine is abundant. The prevalence of good flying weather throughout the year has contributed to the development of Tulsa as an aviation center.

STATION LOCATION

TULSA, OKLAHOMA

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	LATITUDE NORTH	LONGITUDE WEST	ELEVATION ABOVE											AUCOM T O M P A T I O N H E I G H T * *	* Type M = AMOS T = AUTOB S = ASOS W = AWOS	REMARKS
						SEA LEVEL	GROUND												
							G	W	E	P	S	T	R	W	8	H			
<u>COOPERATIVE</u>																			
Downtown site	1887	1910	NA															Precipitation records began 1887; temperatures in 1905. Apparently two precipitation stations operating simultaneously part of period.	
918 S. Maybelle	1910	Present	Unknown	36°09'	96°00'	675		4										Precipitation - river station continuously; temperature station until 12/1931 & during period 6/1934-12/1938.	
<u>AIRPORT</u>																			
Administration Bldg. Municipal Airport 6 mi. NE of Post Office	3/6/30	12/1/31	6.75 mi. NE	36°12'	95°54'	672		25	25			3						Aviation observations only.	
New Terminal Building Municipal Airport	12/1/31	11/2/33	NA	36°12'	95°54'	672		25	25			3						Climatic observations (temp.-pcpn.) began 12/1931.	
Same location	11/2/33	6/10/34	NA	36°12'	95°54'	672	60	10	10			3						Instrument moves.	
Same location	6/10/34	12/6/38	NA	36°12'	95°54'	672	60	10	10			3						CAA made aviation observations only. Climat. observations made at downtown cooperative station.	
Same location	12/6/38	2/24/56	NA	36°12'	95°54'	672	60	5	5	bUnk	3c	a3						Climat observations began 1/1939; complete records began 9/1943. a - Added 1940. b - Added 1942. Height unknown. c - Removed 10/31/50.	
Business Terminal Bldg. Municipal Airport + International Airport effective 11/12/63	2/24/56	11/5/69	NA	36°12'	95°54'	672 f650	39 f23	6	5	8	NA	5	3	d4 e4	NA			Fastest mile data not reliable for north quadrant after 2/24/56. d - Commissioned 4600' ENE of thermometer site 2/5/60. e - Moved 730' SE 8/29/62. f - Effective 8/29/62.	
General Aviation Bldg. International Airport	11/5/69	10/1/92	900 ft. W	36°12'	95°54'	650	g23	NA m4	NA m4	19 j5 K7	NA h16 j4	4 k4	4	g4 l4 n4	NA			g - Not moved 11/5/69. h - Added 6/1/78. i - Minor change 7/2/82. j - Moved to field 7/2/82. k - Minor adjustment 6/14/83. m - Installed 6/20/83. n - Type change 11/28/84.	
International Airport	10/01/92	Present	NA	36°12'	95°53'	679									S			ASOS Commissioned 10/01/92	

SUBSCRIPTION: Price and ordering information available through: National Climatic Data Center, Federal Building, Asheville, North Carolina 28801.
INQUIRIES/COMMENTS CALL: (828) 271-4800

National Climatic Data Center
151 Patton Avenue, Rm 120
Asheville NC 28801-5001

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