

1999

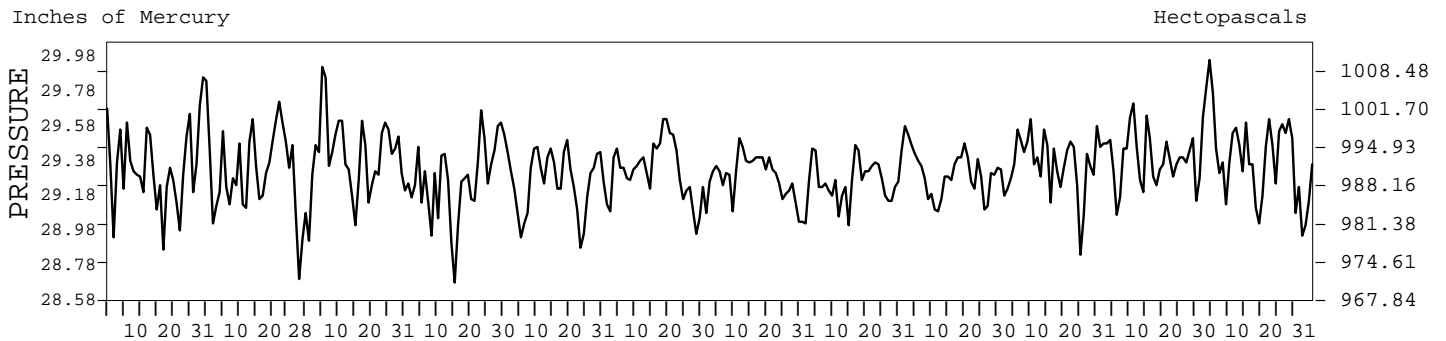
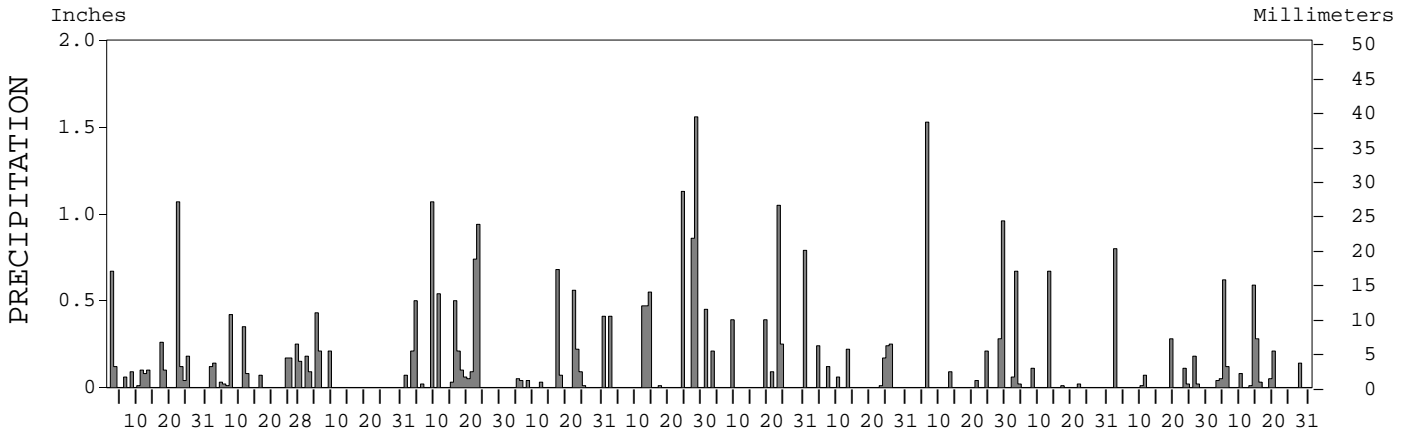
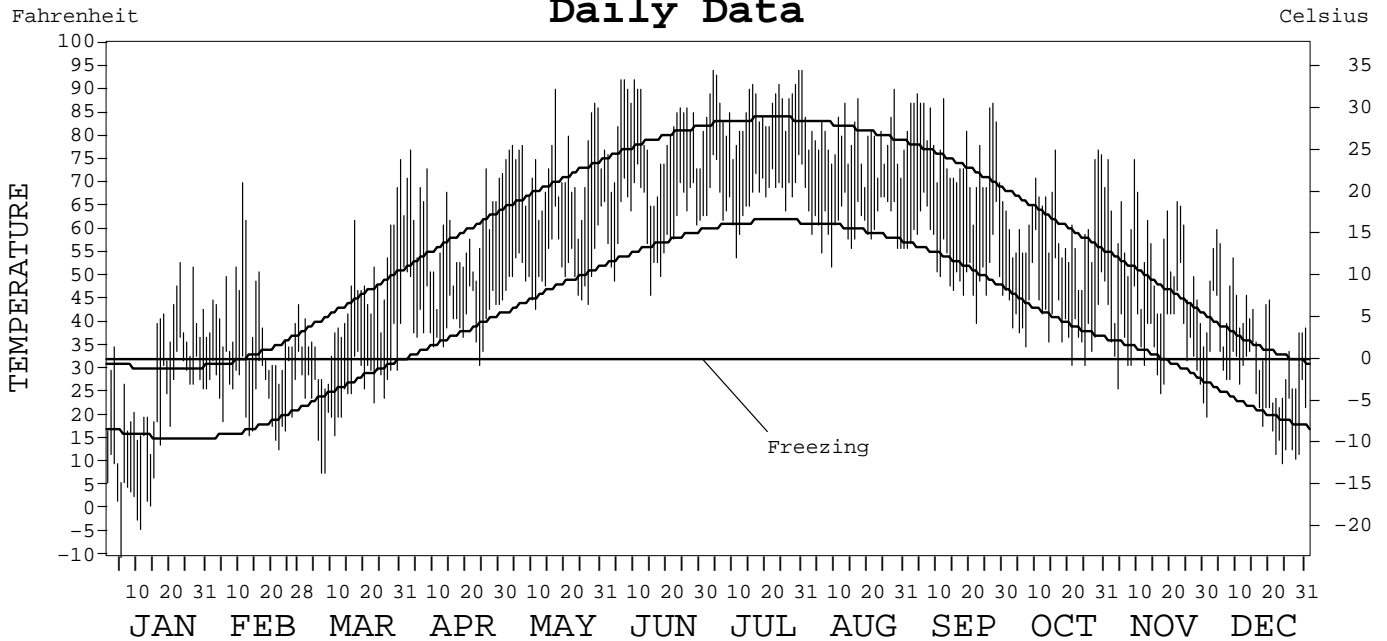
LOCAL CLIMATOLOGICAL DATA
ANNUAL SUMMARY WITH COMPARATIVE DATA



DETROIT, METROPOLITAN AIRPORT
MICHIGAN (DTW)

ISSN 0198-2532

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

DETROIT, MI (DTW)

LATITUDE: 42° 12' 55" N LONGITUDE: 83° 20' 55" W ELEVATION (FT): GRND: 641 BARO: 641 TIME ZONE: EASTERN (UTC + 5) WBAN: 94847

	ELEMENT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR	
TEMPERATURE °F	MEAN DAILY MAXIMUM	30.2	40.5	43.9	60.0	73.2	80.0	86.1	78.9	77.2	61.3	54.4	38.7	60.4	
	HIGHEST DAILY MAXIMUM	53	70	75	77	90	92	94	90	89	77	75	60	94	
	DATE OF OCCURRENCE	23	11	31	03	17	10+	31+	28	04	29+	09+	04	JUL 31+	
	MEAN DAILY MINIMUM	15.9	25.0	25.7	41.3	51.6	61.5	67.5	61.4	53.8	41.8	36.0	25.2	42.2	
	LOWEST DAILY MINIMUM	-10	13	8	31	43	46	54	52	40	31	23	10	-10	
	DATE OF OCCURRENCE	05	22	08+	24	11	15	11	09	22	25+	30	24	JAN 05	
	AVERAGE DRY BULB	23.1	32.8	34.8	50.7	62.4	70.8	76.8	70.2	65.5	51.6	45.2	32.0	51.3	
	MEAN WET BULB	21.6	29.8	30.1	44.1	54.4	63.7	69.9	63.7	58.3	46.7	39.9	29.7	46.0	
	MEAN DEW POINT	17.1	23.9	21.7	36.3	46.7	58.6	66.4	59.3	52.7	41.1	33.5	24.5	40.1	
	NUMBER OF DAYS WITH:														
	MAXIMUM ≥ 90°	0	0	0	0	1	6	8	1	0	0	0	0	0	16
	MAXIMUM ≤ 32°	15	7	4	0	0	0	0	0	0	0	0	9	35	
	MINIMUM ≤ 32°	28	25	27	1	0	0	0	0	0	2	11	22	116	
MINIMUM ≤ 0°	3	0	0	0	0	0	0	0	0	0	0	0	3		
H/C	HEATING DEGREE DAYS	1293	898	927	424	115	33	0	3	81	413	585	1016	5788	
	COOLING DEGREE DAYS	0	0	0	0	43	213	372	171	104	2	0	0	905	
RH	MEAN (PERCENT)	78	71	62	63	60	67	71	71	67	69	67	73	68	
	HOUR 01 LST	78	78	70	69	66	79	80	83	80	77	73	78	76	
	HOUR 07 LST	83	77	74	76	68	79	84	83	88	84	78	81	80	
	HOUR 13 LST	73	64	50	52	48	52	60	57	48	55	56	63	56	
	HOUR 19 LST	73	69	55	56	50	57	61	61	55	64	64	70	61	
S	PERCENT POSSIBLE SUNSHINE														
W/O	NUMBER OF DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	7	5	2	1	0	0	2	0	2	1	2	1	23	
	THUNDERSTORMS	2	0	0	3	3	6	7	2	4	1	1	0	29	
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.)	29.36	29.32	29.39	29.26	29.27	29.32	29.28	29.29	29.29	29.38	29.42	29.37	29.33	
	MEAN SEA-LEVEL PRESS. (IN.)	30.10	30.05	30.12	29.98	29.98	30.03	29.97	29.99	29.99	30.10	30.12	30.07	30.04	
WINDS	RESULTANT SPEED (MPH)	3.9	3.4	3.3	2.0	2.2	1.9	0.6	1.9	2.3	3.8	4.7	5.7	2.2	
	RES. DIR. (TENS OF DEGS.)	24	25	32	08	23	20	25	36	25	26	27	25	26	
	MEAN SPEED (MPH)	11.4	9.9	10.6	9.3	9.0	7.2	8.2	7.5	7.4	9.1	9.6	10.4	9.1	
	PREVAIL. DIR. (TENS OF DEGS.)	24	29	30	08	29	19	22	01	26	22	21	23	22	
	MAXIMUM 2-MINUTE WIND:														
	SPEED (MPH)	38	36	37	43	43	28	39	24	28	33	32	39	43	
	DIR. (TENS OF DEGS.)	23	26	28	23	22	22	29	19	29	34	25	22	22	
	DATE OF OCCURRENCE	03	12	18	06	17	28	31	10	06	13	24	15	MAY 17	
	MAXIMUM 5-SECOND WIND:														
	SPEED (MPH)	46	46	45	49	54	40	55	32	37	40	38	49	55	
DIR. (TENS OF DEGS.)	23	26	28	23	22	24	29	30	29	33	26	23	29		
DATE OF OCCURRENCE	03	12	18	06	17	07	31	04	06	13	24	15	JUL 31		
PRECIPITATION	WATER EQUIVALENT:														
	TOTAL (IN.)	3.00	1.98	1.12	5.13	2.20	5.46	3.62	1.31	3.11	1.56	1.49	2.22	32.20	
	GREATEST 24-HOUR (IN.)	1.08	0.42	0.64	1.16	0.72	1.56	1.05	0.25	1.53	0.68	0.80	0.70	1.56	
	DATE OF OCCURRENCE	22-23	07	05-06	22-23	17-18	28	23	26	06	03-04	02	05-06	JUN 28	
	NUMBER OF DAYS WITH:														
PRECIPITATION ≥ 0.01	14	13	5	15	11	8	8	8	6	7	8	12	115		
PRECIPITATION ≥ 0.10	9	8	4	9	4	7	7	6	4	3	4	6	71		
PRECIPITATION ≥ 1.00	1	0	0	1	0	2	1	0	1	0	0	0	6		
SNOWFALL	SNOW, ICE PELLETS, HAIL:														
	TOTAL (IN.)	27.3	7.8	13.2	0.0	0.0	0.0	0.0	0.0	0.0	T	T	4.0	52.3	
	GREATEST 24-HOUR (IN.)	10.6	4.2	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	T	2.6	10.6	
	DATE OF OCCURRENCE	02	07	05							13	29+	28	JAN 02	
	MAXIMUM SNOW DEPTH (IN.)	24	4	9	0	0	0	0	0	0	0	0	3	24	
	DATE OF OCCURRENCE	15+	07	09									28	JAN 15+	
NUMBER OF DAYS WITH:															
SNOWFALL ≥ 1.0	7	3	3	0	0	0	0	0	0	0	0	2	15		

NORMALS, MEANS, AND EXTREMES

DETROIT, MI (DTW)

LATITUDE: 42° 12' 55" N LONGITUDE: 83° 20' 55" W ELEVATION (FT): GRND: 641 BARO: 641 TIME ZONE: EASTERN (UTC + 5) WBAN: 94847

ELEMENT		POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	30.3	33.3	44.4	57.7	69.6	78.9	83.3	81.3	73.9	61.5	48.1	35.2	58.1
	MEAN DAILY MAXIMUM	41	30.8	33.9	44.4	57.9	69.8	79.1	83.3	81.2	74.1	61.7	47.9	35.6	58.3
	HIGHEST DAILY MAXIMUM	41	62	70	81	89	93	104	102	100	98	91	77	69	104
	YEAR OF OCCURRENCE		1995	1999	1998	1977	1988	1988	1988	1988	1976	1963	1968	1998	JUN 1988
	MEAN OF EXTREME MAXS.	41	49.6	52.1	69.2	79.0	86.1	92.0	93.7	91.8	88.8	79.7	67.3	55.5	75.4
	NORMAL DAILY MINIMUM	30	15.6	17.6	27.0	36.8	47.1	56.3	61.3	59.6	52.5	40.9	32.2	21.4	39.0
	MEAN DAILY MINIMUM	41	16.4	18.5	27.0	37.3	47.7	57.1	61.8	60.4	52.9	41.4	32.4	22.4	39.6
	LOWEST DAILY MINIMUM	41	-21	-15	-4	10	25	36	41	38	29	17	9	-10	-21
	YEAR OF OCCURRENCE		1984	1985	1978	1982	1966	1972	1965	1982	1974	1974	1969	1983	JAN 1984
	MEAN OF EXTREME MINS.	41	-4.0	-6	9.4	22.9	34.0	43.9	50.1	48.6	37.4	26.6	17.6	2.5	24.0
	NORMAL DRY BULB	30	22.9	25.4	35.7	47.3	58.4	67.6	72.3	70.5	63.2	51.2	40.2	28.3	48.6
	MEAN DRY BULB	41	23.5	26.2	35.6	47.6	58.7	68.1	72.5	70.9	63.5	51.6	40.0	29.1	48.9
	MEAN WET BULB	16	23.8	25.7	32.4	42.6	52.9	61.8	66.2	65.1	57.8	47.1	37.0	28.5	45.1
	MEAN DEW POINT	16	18.9	20.1	25.9	35.4	46.2	56.4	61.6	61.1	53.5	42.1	31.9	23.8	39.7
	NORMAL NO. DAYS WITH:														
MAXIMUM ≥ 90°	30	0.0	0.0	0.0	0.0	0.4	2.7	5.3	2.7	0.7	0.1	0.0	0.0	11.9	
MAXIMUM ≤ 32°	30	17.1	13.2	4.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	1.3	11.7	47.6	
MINIMUM ≤ 32°	30	29.2	25.3	22.6	10.0	0.9	0.0	0.0	0.0	0.1	5.0	16.4	26.5	136.0	
MINIMUM ≤ 0°	30	3.8	2.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	7.5	
H/C	NORMAL HEATING DEG. DAYS	30	1305	1109	908	531	243	38	0	16	102	435	744	1138	6569
	NORMAL COOLING DEG. DAYS	30	0	0	0	0	38	116	231	186	48	7	0	0	626
RH	NORMAL (PERCENT)	30	75	73	70	66	65	67	68	72	73	72	75	77	71
	HOUR 01 LST	30	78	77	76	74	76	79	81	83	84	80	79	80	79
	HOUR 07 LST	30	80	79	79	78	78	79	82	86	87	84	82	81	81
	HOUR 13 LST	30	69	65	61	54	53	54	54	56	58	57	66	71	60
	HOUR 19 LST	30	73	70	66	59	56	58	58	63	68	68	73	76	66
S	PERCENT POSSIBLE SUNSHINE	31	40	46	52	53	60	65	68	67	61	51	35	31	52
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG (VISBY ≤ 1/4 MI)	42	2.5	2.4	2.3	0.9	0.8	0.7	0.6	1.3	1.6	2.0	1.7	3.0	19.8
	THUNDERSTORMS	42	0.2	0.4	1.6	3.1	3.7	6.0	5.9	5.2	4.1	1.3	0.6	0.4	32.5
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)														
	MIDNIGHT-MIDNIGHT (OKTAS)														
	MEAN NO. DAYS WITH:														
	CLEAR														
	PARTLY CLOUDY														
	CLOUDY														
PR	MEAN STATION PRESSURE (IN)	27	29.30	29.30	29.30	29.30	29.30	29.29	29.30	29.30	29.30	29.31	29.31	29.30	29.30
	MEAN SEA-LEVEL PRES. (IN)	16	30.07	30.08	30.05	29.95	29.98	30.01	29.99	30.04	30.04	30.07	30.06	30.08	30.03
WINDS	MEAN SPEED (MPH)	37	11.9	11.4	11.9	11.5	10.1	9.2	8.6	8.3	8.8	9.9	11.3	11.2	10.3
	PREVAIL. DIR (TENS OF DEGS)	32	24	23	29	23	04	23	23	23	23	23	24	23	23
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	4	44	51	46	46	43	32	53	33	33	47	45	49	53
	DIR. (TENS OF DEGS)		22	22	21	24	22	27	28	23	21	24	24	29	28
	YEAR OF OCCURRENCE		1996	1997	1996	1997	1999	1998	1998	1998	1997	1996	1998	1998	JUL 1998
	MAXIMUM 5-SECOND:														
SPEED (MPH)	4	53	59	53	57	54	41	67	39	45	56	58	60	67	
DIR. (TENS OF DEGS)		24	23	24	24	22	27	28	30	28	24	25	31	28	
YEAR OF OCCURRENCE		1996	1997	1996	1997	1999	1998	1998	1996	1997	1996	1998	1998	JUL 1998	
PRECIPITATION	NORMAL (IN)	30	1.76	1.74	2.55	2.95	2.92	3.61	3.18	3.43	2.89	2.10	2.67	2.82	32.62
	MAXIMUM MONTHLY (IN)	41	3.92	5.02	4.48	5.40	6.20	7.04	6.02	7.83	7.52	4.87	5.68	6.00	7.83
	YEAR OF OCCURRENCE		1993	1990	1973	1961	1991	1987	1969	1975	1986	1967	1982	1965	AUG 1975
	MINIMUM MONTHLY (IN)	41	0.27	0.15	0.82	0.92	0.87	0.97	0.59	0.43	0.43	0.35	0.79	0.46	0.15
	YEAR OF OCCURRENCE		1961	1969	1981	1971	1988	1988	1974	1996	1960	1964	1976	1960	FEB 1969
	MAXIMUM IN 24 HOURS (IN)	41	1.72	2.41	1.82	1.97	2.87	2.84	4.34	3.21	3.52	2.57	2.20	3.71	4.34
	YEAR OF OCCURRENCE		1967	1998	1997	1965	1968	1983	1998	1964	1990	1985	1982	1965	JUL 1998
	NORMAL NO. DAYS WITH:														
PRECIPITATION ≥ 0.01	30	13.0	11.0	13.2	12.3	11.0	10.5	9.2	9.3	9.8	9.6	11.6	14.1	134.6	
PRECIPITATION ≥ 1.00	30	0.1	0.2	0.2	0.4	0.6	0.9	0.9	1.0	0.5	0.4	0.3	0.4	5.9	
SNOWFALL	NORMAL (IN)	30	10.0	9.2	6.6	1.8	T	0.0	0.0	0.0	0.0	0.2	3.0	10.9	41.7
	MAXIMUM MONTHLY (IN)	40	29.6	20.8	16.1	9.0	T	0.0	0.0	0.0	T	2.9	11.8	34.9	34.9
	YEAR OF OCCURRENCE		1978	1986	1965	1982	1994				1994	1980	1966	1974	DEC 1974
	MAXIMUM IN 24 HOURS (IN)	40	11.1	10.3	9.2	7.4	T	0.0	0.0	0.0	T	2.9	5.6	19.2	19.2
	YEAR OF OCCURRENCE		1992	1965	1973	1982	1994				1994	1980	1977	1974	DEC 1974
	MAXIMUM SNOW DEPTH (IN)	39	24	18	9	6	0	0	0	0	0	1	6	19	24
	YEAR OF OCCURRENCE		1999	1982	1982	1982						1980	1966	1974	JAN 1999
	NORMAL NO. DAYS WITH:														
SNOWFALL ≥ 1.0	30	3.1	3.1	2.1	0.6	0.0	0.0	0.0	0.0	0.0	0.1	1.1	3.3	13.4	

PRECIPITATION (inches) 1999 DETROIT, METROPOLITAN AIRPORT MI (DTW)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	1.11	0.86	2.62	3.32	3.01	3.90	3.30	2.75	1.63	1.91	2.73	1.61	28.75
1971	1.03	2.68	1.59	0.92	1.97	2.17	1.95	1.62	2.72	1.01	1.34	3.79	22.79
1972	1.28	1.00	2.55	3.63	2.68	3.30	2.21	3.07	3.40	2.24	3.19	3.11	31.66
1973	1.65	1.08	4.48	1.42	3.72	4.86	4.66	1.67	1.82	2.01	3.21	3.51	34.09
1974	3.26	2.37	4.20	2.75	3.49	2.38	0.59	2.95	2.22	0.81	2.86	4.00	31.88
1975	2.90	2.65	1.66	2.50	2.82	2.39	1.98	7.83	3.18	1.29	2.39	3.00	34.59
1976	1.91	2.87	4.24	3.15	3.26	3.26	1.47	1.68	3.66	2.01	0.79	0.79	29.09
1977	0.98	1.64	3.57	4.17	2.40	3.16	3.28	2.23	4.23	1.37	2.88	2.97	32.88
1978	3.16	0.45	2.05	2.49	3.58	2.69	1.97	1.73	1.82	2.49	2.41	2.81	27.65
1979	1.52	0.57	2.44	4.97	2.82	4.04	4.96	2.99	0.94	1.24	4.19	2.36	33.04
1980	0.69	1.00	3.88	4.23	3.22	6.42	4.33	6.09	2.94	1.26	0.88	2.30	37.24
1981	0.57	3.13	0.82	3.44	2.60	3.33	4.29	2.32	5.47	3.92	1.26	2.38	33.53
1982	3.43	1.10	3.14	1.60	2.83	4.11	4.78	0.72	2.55	1.01	5.68	3.29	34.24
1983	0.84	0.89	1.87	4.20	5.47	4.88	4.53	1.57	2.49	2.85	4.28	3.78	37.65
1984	0.78	1.31	3.12	2.48	3.62	1.04	0.95	3.00	2.30	2.28	2.49	2.90	26.27
1985	2.63	3.83	4.42	2.11	3.11	1.62	3.96	4.88	2.59	3.91	5.51	1.51	40.08
1986	1.30	3.46	2.29	2.73	1.36	5.75	2.47	3.52	7.52	3.05	1.88	2.28	37.61
1987	2.35	0.53	2.19	2.14	2.50	7.04	2.20	6.87	2.69	2.00	3.17	4.60	38.28
1988	1.30	2.02	1.16	1.50	0.87	0.97	2.43	3.13	3.65	3.57	4.29	1.97	26.86
1989	1.28	0.77	2.16	2.22	4.16	3.79	4.21	2.14	3.03	1.73	2.53	1.24	29.26
1990	1.80	5.02	1.91	2.72	3.74	4.92	1.47	3.85	6.06	4.14	2.64	4.37	42.64
1991	1.44	0.94	1.41	2.66	6.20	1.89	1.23	4.31	0.90	4.14	2.61	1.91	29.64
1992	1.78	1.54	3.34	4.34	1.33	2.35	5.91	2.50	5.55	2.01	4.33	2.35	37.33
1993	3.92	1.27	2.12	3.32	1.24	6.05	2.17	1.60	4.26	2.21	1.69	0.78	30.63
1994	2.79	1.38	2.29	4.04	1.18	3.97	3.20	3.30	2.38	1.35	2.74	2.39	31.01
1995	2.47	0.89	1.73	3.44	3.55	1.55	3.40	3.71	0.62	3.53	3.08	0.85	28.82
1996	1.85	1.76	1.56	3.39	2.82	2.37	2.64	0.43	4.42	1.59	1.99	2.57	27.39
1997	1.57	3.90	3.22	1.56	5.23	3.17	2.68	3.22	3.41	1.91	0.94	1.61	32.42
1998	2.60	3.56	3.62	3.86	2.46	2.69	5.72	4.19	1.50	1.41	1.36	1.16	34.13
1999	3.00	1.98	1.12	5.13	2.20	5.46	3.62	1.31	3.11	1.56	1.49	2.22	32.20
POR= 41 YRS	1.95	1.80	2.45	3.08	2.92	3.57	3.16	3.19	2.83	2.14	2.49	2.52	32.10

WBAN : 94847

AVERAGE TEMPERATURE (°F) 1999 DETROIT, METROPOLITAN AIRPORT MI (DTW)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	16.6	24.4	32.9	49.3	60.9	68.4	72.6	72.1	64.5	54.2	40.0	29.0	48.7
1971	20.7	27.4	32.0	45.2	56.4	70.8	69.6	70.3	66.6	58.5	38.5	33.3	49.1
1972	23.8	24.6	32.6	44.6	60.3	64.2	71.2	69.1	63.0	47.3	37.4	29.4	47.3
1973	28.8	25.3	43.3	48.8	55.5	69.9	72.6	72.9	64.9	56.2	41.4	28.7	50.7
1974	26.5	23.6	35.7	49.2	55.2	65.9	72.5	72.3	59.7	48.8	40.6	28.6	48.2
1975	28.3	27.5	32.5	40.9	62.8	69.0	72.2	72.3	59.1	52.9	46.8	29.1	49.5
1976	19.2	33.3	40.4	50.0	56.4	70.6	72.7	70.2	62.1	47.4	33.5	21.5	48.1
1977	12.8	25.2	41.5	52.4	64.4	65.5	75.8	70.6	65.1	47.9	40.5	25.5	48.9
1978	19.6	16.3	30.0	45.5	59.3	66.8	70.6	71.9	67.5	50.2	40.5	28.9	47.3
1979	18.6	16.5	37.7	44.6	56.5	66.6	70.4	67.9	62.6	50.1	39.5	31.9	46.9
1980	24.5	22.2	31.3	45.9	59.8	63.7	72.7	72.7	63.8	46.3	37.4	26.0	47.2
1981	19.0	28.8	36.5	49.8	55.9	68.0	72.4	70.0	60.9	47.6	41.1	27.8	48.2
1982	17.1	20.7	33.0	43.2	64.3	64.2	72.4	67.7	61.8	52.6	41.6	37.3	48.0
1983	28.7	31.6	38.4	44.2	54.4	68.2	74.5	73.6	64.0	51.6	41.2	20.8	49.3
1984	18.0	33.3	28.9	47.8	54.5	70.8	70.8	72.7	61.2	54.9	38.6	34.0	48.8
1985	20.4	23.5	38.4	51.0	60.1	62.8	71.3	69.2	64.3	53.0	42.4	22.2	48.2
1986	23.9	24.6	37.6	50.6	61.3	67.3	75.0	68.9	65.9	52.6	37.3	31.7	49.7
1987	26.1	29.6	39.8	50.8	63.3	71.3	76.1	71.6	64.6	46.6	43.5	33.6	51.4
1988	23.8	23.4	36.9	48.5	62.0	70.4	77.1	75.1	63.3	46.0	42.2	28.7	49.8
1989	32.8	24.1	35.2	45.1	57.5	67.5	73.0	69.9	61.9	52.1	38.2	18.0	47.9
1990	33.6	30.7	39.5	49.0	56.6	68.5	72.2	71.2	64.5	52.8	44.2	32.8	51.3
1991	25.0	31.2	40.3	52.0	66.5	72.4	74.9	73.4	63.1	54.8	38.5	32.1	52.0
1992	28.3	30.8	35.5	46.3	58.3	65.5	68.8	66.7	61.4	49.7	40.5	33.2	48.8
1993	29.4	24.2	34.7	47.8	60.2	67.5	75.5	74.5	61.0	51.9	41.2	30.8	49.9
1994	17.3	23.5	37.1	51.2	58.7	72.3	74.2	69.6	66.2	53.8	45.5	35.4	50.4
1995	28.4	24.9	39.2	45.7	59.7	71.6	74.8	77.2	62.8	55.1	35.5	25.6	50.0
1996	24.3	26.0	30.8	45.2	56.7	70.7	70.6	72.9	64.1	52.0	34.3	31.5	48.3
1997	23.0	30.6	37.2	45.8	52.0	69.5	72.2	68.1	62.7	51.8	37.1	32.2	48.5
1998	32.8	36.7	39.5	50.4	65.6	69.1	73.4	73.2	68.0	53.8	43.8	35.3	53.5
1999	23.1	32.8	34.8	50.7	62.4	70.8	76.8	70.2	65.5	51.6	45.2	32.0	51.3
POR= 41 YRS	23.5	26.3	35.6	47.7	58.8	67.9	72.5	70.9	63.5	51.5	40.0	29.2	48.9

HEATING DEGREE DAYS (base 65°F) 1999 DETROIT, METROPOLITAN AIRPORT MI (DTW)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	8	8	108	339	742	1105	1368	1047	1015	588	278	22	6628
1971-72	13	6	72	213	788	977	1272	1165	997	608	174	91	6376
1972-73	24	28	113	539	822	1096	1115	1103	667	480	289	3	6279
1973-74	0	10	98	276	702	1119	1189	1152	901	476	308	54	6285
1974-75	0	2	189	495	726	1123	1129	1043	996	714	142	41	6600
1975-76	4	0	178	375	537	1107	1413	914	757	473	269	6	6033
1976-77	1	15	133	540	938	1341	1609	1106	721	395	122	85	7006
1977-78	1	17	85	524	729	1218	1400	1357	1077	580	235	65	7288
1978-79	17	0	73	452	728	1112	1432	1355	843	604	291	55	6962
1979-80	12	29	126	471	758	1019	1249	1233	1036	568	191	104	6796
1980-81	0	0	110	578	822	1201	1418	1008	878	452	293	19	6779
1981-82	3	9	167	534	710	1144	1477	1237	985	647	75	70	7058
1982-83	2	39	145	383	696	852	1119	928	816	618	323	59	5980
1983-84	6	0	125	418	708	1367	1450	912	1112	507	334	9	6948
1984-85	11	4	164	310	785	955	1377	1154	818	435	177	93	6283
1985-86	2	8	129	366	672	1317	1271	1125	842	435	166	48	6381
1986-87	1	33	76	380	824	1028	1198	984	776	423	158	11	5892
1987-88	4	30	69	566	639	969	1273	1201	864	486	138	46	6285
1988-89	2	3	90	590	679	1118	991	1138	916	591	254	33	6405
1989-90	0	11	151	400	797	1451	966	955	785	506	258	27	6307
1990-91	1	1	112	380	618	994	1234	939	761	394	125	5	5564
1991-92	0	0	151	319	788	1013	1129	985	906	555	224	59	6129
1992-93	15	30	153	469	725	976	1097	1138	931	506	161	51	6252
1993-94	0	2	155	404	710	1050	1472	1156	858	433	238	24	6502
1994-95	0	9	55	345	579	910	1129	1115	793	573	170	17	5695
1995-96	2	0	125	306	877	1215	1253	1122	1055	589	289	8	6841
1996-97	3	0	102	397	915	1033	1297	959	855	566	394	25	6546
1997-98	3	13	103	435	830	1008	991	787	791	431	69	80	5541
1998-99	0	2	44	350	629	914	1293	898	927	424	115	33	5629
1999-	0	3	81	413	585	1016							

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COOLING DEGREE DAYS (base 65°F) 1999 DETROIT, METROPOLITAN AIRPORT MI (DTW)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1970	0	0	0	17	50	161	249	236	100	12	0	0	825
1971	0	0	0	0	14	205	161	177	128	17	0	0	702
1972	0	0	0	0	36	73	222	160	59	0	0	0	550
1973	0	0	0	3	2	156	241	261	104	11	0	0	778
1974	0	0	0	8	10	91	237	237	36	1	0	0	620
1975	0	0	0	0	82	171	233	232	7	6	0	0	731
1976	0	0	0	30	10	182	246	182	53	3	0	0	706
1977	0	0	0	25	108	107	341	198	94	0	0	0	873
1978	0	0	0	0	63	122	200	221	154	0	0	0	760
1979	0	0	0	0	32	109	184	124	57	16	0	0	522
1980	0	0	0	3	38	69	246	248	79	3	0	0	686
1981	0	0	0	1	17	118	241	168	51	0	0	0	596
1982	0	0	0	0	58	55	237	129	57	5	0	0	541
1983	0	0	0	2	0	160	306	272	104	6	0	0	850
1984	0	0	0	0	15	189	197	252	55	2	0	0	710
1985	0	0	0	25	32	32	201	146	116	0	0	0	552
1986	0	0	0	10	55	120	319	160	110	3	0	0	777
1987	0	0	0	4	111	207	355	245	64	0	1	0	987
1988	0	0	0	0	52	214	385	322	46	8	0	0	1027
1989	0	0	0	0	29	114	256	171	64	5	0	0	639
1990	0	0	1	32	8	139	234	200	101	11	0	0	726
1991	0	0	0	10	179	233	315	268	104	9	0	0	1118
1992	0	0	0	0	27	80	143	91	51	0	0	0	392
1993	0	0	0	0	21	135	334	302	41	5	0	0	838
1994	0	0	0	24	49	248	290	160	97	2	0	0	870
1995	0	0	0	0	11	222	312	383	67	7	0	0	1002
1996	0	0	0	2	37	185	184	251	82	0	0	0	741
1997	0	0	0	0	0	165	231	114	40	29	0	0	579
1998	0	0	7	0	95	209	268	261	136	9	0	0	985
1999	0	0	0	0	43	213	372	171	104	2	0	0	905

SNOWFALL (inches) 1999 DETROIT, METROPOLITAN AIRPORT MI (DTW)

YEAR	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
1970-71	0.0	0.0	0.0	0.0	1.7	9.8	8.7	5.9	8.7	0.6	0.0	0.0	35.4
1971-72	0.0	0.0	0.0	0.0	4.2	2.6	7.9	9.3	2.5	2.5	0.0	0.0	29.0
1972-73	0.0	0.0	0.0	T	7.1	12.5	2.4	12.8	10.1	0.1	T	0.0	45.0
1973-74	0.0	0.0	0.0	0.0	0.1	16.4	14.1	11.2	5.7	1.7	T	0.0	49.2
1974-75	0.0	0.0	0.0	T	7.7	34.9	4.9	7.5	4.5	3.6	0.0	0.0	63.1
1975-76	0.0	0.0	0.0	0.0	6.5	19.8	15.1	4.9	7.5	2.1	T	0.0	55.9
1976-77	0.0	0.0	0.0	T	1.4	9.8	14.7	5.0	12.3	0.7	0.0	0.0	43.9
1977-78	0.0	0.0	0.0	0.0	7.4	16.6	29.6	5.3	2.5	0.3	0.0	0.0	61.7
1978-79	0.0	0.0	0.0	0.0	6.1	6.6	13.3	3.9	2.7	3.0	0.0	0.0	35.6
1979-80	0.0	0.0	0.0	T	3.2	2.3	2.8	5.5	11.7	1.4	0.0	0.0	26.9
1980-81	0.0	0.0	0.0	2.9	3.4	10.5	7.6	13.4	0.6	0.0	0.0	0.0	38.4
1981-82	0.0	0.0	0.0	0.1	0.7	17.3	20.0	13.3	13.6	9.0	0.0	0.0	74.0
1982-83	0.0	0.0	0.0	T	1.8	1.4	1.5	4.3	7.6	3.4	0.0	0.0	20.0
1983-84	0.0	0.0	0.0	0.0	3.5	19.9	9.9	8.7	9.7	0.1	0.0	0.0	51.8
1984-85	0.0	0.0	0.0	0.0	4.1	6.2	20.9	16.9	6.1	0.9	0.0	0.0	55.1
1985-86	0.0	0.0	0.0	0.0	2.0	14.1	8.6	20.8	7.4	1.3	0.0	0.0	54.2
1986-87	0.0	0.0	0.0	T	3.3	6.0	24.0	2.0	13.3	1.1	0.0	0.0	49.7
1987-88	0.0	0.0	0.0	T	0.7	15.3	7.0	19.2	2.7	0.2	0.0	0.0	45.1
1988-89	0.0	0.0	0.0	T	1.0	6.3	5.3	9.6	2.4	0.5	T	0.0	25.1
1989-90	0.0	0.0	0.0	2.7	2.4	11.8	4.0	11.1	7.8	2.0	0.0	0.0	41.8
1990-91	0.0	0.0	T	0.0	T	13.2	8.8	9.2	0.2	T	T	0.0	31.4
1991-92	0.0	0.0	0.0	T	2.2	8.6	18.4	2.4	11.7	0.2	0.0	0.0	43.5
1992-93	0.0	0.0	0.0	0.4	0.9	5.0	11.0	15.2	15.7	4.0	0.0	0.0	52.2
1993-94	0.0	0.0	0.0	0.4	0.6	1.9	17.9	17.1	3.7	4.2	T	0.0	45.8
1994-95	0.0	0.0	T	0.0	T	9.6	13.1	5.7	3.5	1.6	0.0	0.0	33.5
1995-96	0.0	0.0	0.0	0.0	1.3	4.5	6.3		11.8				
1996-97													
1997-98					4.6	6.0	8.3	T	4.4	0.0	T	0.0	
1998-99	0.0	0.0	T	0.0	0.0	1.2	27.3	7.8	13.2	0.0	0.0	0.0	49.5
1999-	0.0	0.0	0.0	T	T	4.0							
POR= 39 YRS	0.0	0.0	T	0.2	2.7	9.6	10.5	8.8	6.8	1.7	T	0.0	40.3

WBAN : 94847

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
DETROIT, METROPOLITAN AIRPORT
MICHIGAN (DTW)

Detroit and the immediate suburbs, including nearby urban areas in Canada, occupy an area approximately 25 miles in radius. The waterway, consisting of the Detroit and St. Clair Rivers, Lake St. Clair, and the west end of Lake Erie, lies at an elevation of 568 to 580 feet above sea level. Nearly flat land slopes up gently from the waters edge northwestward for about 10 miles and then gives way to increasingly rolling terrain. The Irish Hills, parallel to and about 40 miles northwest of the waterway, have tops 1,000 to 1,250 feet above sea level. On the Canadian side of the waterway the land is relatively level.

Northwest winds in winter bring snow flurry accumulations to all of Michigan except in the Detroit Metropolitan area while summer showers moving from the northwest weaken and sometimes dissipate as they approach Detroit. On the other hand, much of the heaviest precipitation in winter comes from southeast winds, especially to the northwest suburbs of the city.

The climate of Detroit is influenced by its location with respect to major storm tracks and the influence of the Great Lakes. The normal wintertime storm track is south of the city, which brings on the average, about 3 inch snowfalls. Winter storms can bring combinations of rain, snow, freezing rain, and sleet with heavy snowfall accumulations possible at times. In summer, most storms pass to the north allowing for intervals of warm, humid, sunny skies with occasional thunderstorms followed by days of mild, dry, and fair weather. Temperatures of 90 degrees or higher are reached during each summer.

The most pronounced lake effect occurs in the winter when arctic air moving across the lakes is warmed and moistened. This produces an excess of cloudiness but a moderation of cold wave temperatures.

Local climatic variations are due largely to the immediate effect of Lake St. Clair and the urban heat island. On warm days in late spring or early summer, lake breezes often lower temperatures by 10 to 15 degrees in the eastern part of the city and the northeastern suburbs. The urban heat island effect shows up mainly at night where minimum temperatures at the Metropolitan Airport average 4 degrees lower than downtown Detroit. On humid summer nights or on very cold winter nights, this difference can exceed 10 degrees.

The growing season averages 180 days and has ranged from 145 days to 205 days. On average, the last freezing temperature occurs in late April while the average first freezing temperature occurs in late October. A freeze has occurred as late as mid-May and as early as late September.

Air pollution comes primarily from heavy industry spread along both shores of the waterway from Port Huron to Toledo. However, wind dispersion is usually sufficient to keep it from becoming a major hazard.

STATION LOCATION

DETROIT, MICHIGAN
METROPOLITAN AIRPORT

LOCATION	OCCUPIED FROM	OCCUPIED TO	AIRLINE DISTANCES AND DIRECTIONS FROM PREVIOUS LOCATION	NORTH	WEST	ELEVATION ABOVE											A U T O M A T I C O B S E R V I N G	* Type M = AMOS T = AUTOB S = ASOS W = AWOS	REMARKS	
						SEA LEVEL	GROUND													
							W I N D S O N E	E M E R S O N	R O O F T O P	S U R F A C E	T E L E P O L E	R A I N G A N N	W E I G H T I N G	8 I N C H	H I G H E S T	H I G H E S T				H I G H E S T
<u>COOPERATIVE</u>																				
C.S. Woodard Ypsilanti, Michigan	1/1/63	12/31/90	NA	42°15'	83°38'															
L.R. Brown Rawsonville, Michigan	4/1/89	12/31/94	4 mi. SE	42°12'	83°34'															
Eloise State Hospital Eloise, Michigan	3/1/97	9/21/42	12 mi. ENE	42°17'	83°19'	640		a5 b89							a3 b37			a - Through 1939. b - 1940 to 9/21/42.		
Wayne, Michigan	9/22/42	4/30/46	2 mi. W	42°17'	83°23'	640		5							3					
Wayne, Michigan	5/1/46	7/1956	1 mi. S	42°16'	83°23'	640		5							3					
<u>AIRPORT</u>																				
Willow Run Airport	7/15/42	9/30/68 (A)	NA	42°14'	83°32'	722 e711	112 c20	62 e5 f	62 f	NA	NA	62 f	62	NA d5 g	NA			Wind affected to some extent by eddy currents over roof to 7/19/61. c - Moved to field site 7/19/61. d - Commissioned 4400' ESE of temp. sensors 9/1/61. e - Effective 9/1/61. f - Removed 1968. g - Removed 2/1981. (A) Local Climatological Data published through September 1968. FAA operation beginning with October 1968.		
Metropolitan Airport	10/3/58	07/01/95	NA	42°14'	83°20'	630 k633	58 i20 r33	5 h5	5 h5	NA n48	NA p33	5 m5	5 h5	NA j69 s5 t5	NA			h - Minor move 12/1/58. i - Effective 9/21/61. j - Commissioned 2200' S of New Terminal Building 11/1/61. k - Effective 11/1/61. l - Type change 4/20/66. m - Transferred from City AP and installed 4/20/66. n - Commissioned 4/28/67. o - Type change 11/11/78. p - Relocated and raised 12/6/84. q - Relocated and type change 2/21/85. r - Type change 11/27/85. s - ASOS Commissioned 07/01/95		
Metropolitan Airport	07/01/95	Present	NA	42°13'	83°21'	641									S					

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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