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APPENDIX 1

Heatwave Days at Sydney according to *Definition 2* (temperatures >= 35C)

Temperature >= 35C							
Year	Month	Day	Temperature	Year	Month	Day	Temperature
1859	01	18	36.9	1869	11	18	36.2
1859	02	7	35.6	1869	12	27	37.5
1859	10	10	35	1870	01	13	40.7
1859	12	10	36.6	1870	12	7	37.3
1860	01	12	37.4	1871	12	22	39.9
1861	03	4	35.6	1872	01	17	36.8
1861	03	24	36.1	1873	12	16	37.8
1862	01	11	35.3	1874	10	12	35.6
1862	01	16	36	1874	12	23	35.7
1862	11	8	36.6	1875	01	29	36.1
1862	11	20	37.8	1875	02	4	37.2
1862	12	6	38.1	1875	12	1	35.3
1863	01	5	41.6	1876	02	25	36.1
				1876	02	26	35.8
1863	12	10	36.6				
				1877	12	23	36.3
1865	02	3	36.2				
				1877	12	28	35.3
1865	02	7	36.7				
				1878	11	21	39.3
1865	10	27	35				
				1879	10	23	35
1865	11	1	36.2				
				1879	12	1	35.8
1865	12	14	36.1				
				1881	02	13	38.1
1865	12	21	38.9				
				1882	02	16	35.5
1866	02	19	38.3				
				1882	12	19	37.7
1867	10	24	36.7				
				1883	12	6	35.1
1867	11	16	37.3				
				1883	12	12	37.6
1868	12	25	38.6				
				1884	01	7	37.8
1869	01	6	35.4				
				1884	01	14	38.2
1869	03	1	35.8				
				1885	01	9	35.9
1869	03	3	39.2				
				1885	01	31	35.9

Year	Month	Day	Temperature
1885	11	5	36.4
1886	02	12	36.3
1888	01	18	36.8
1889	01	14	39.3
1889	02	27	35.9
1889	12	6	36.1
1889	12	27	37.5
1891	01	9	36.3
1891	01	27	35.4
1891	12	16	36.2
1891	12	30	36.4
1894	01	12	36.1
1894	02	12	36.1
1894	11	26	36.4
1895	12	16	35.6
1896	01	4	35.1
1896	01	6	40.7
1896	01	10	36.9
1896	01	11	37.8
1896	01	12	36.5
1896	01	13	42.5
1896	01	18	37.2
1896	02	1	36.7
1896	12	28	38.6
1897	11	12	36.7
1897	11	20	37.4
1897	11	25	36.9
1898	01	19	36.7
1898	10	19	37.2
1899	11	28	37.2
1899	12	1	38.9
1899	12	2	36.7
1900	01	19	35.6
1900	10	20	36.3
1900	12	17	40.1
1901	11	26	36.7
1901	12	17	40
1902	02	6	35.7
1902	02	20	35.4
1902	03	26	36.1
1902	11	7	35
1902	12	24	37.8
1903	02	3	36.7
1903	11	26	35.1
1904	01	26	36
1904	12	15	35.6
1904	12	31	41.9
1905	02	23	35.3
1905	11	12	35.2
1905	11	17	36.7
1906	02	22	36.3
1908	11	3	35.1
1908	11	7	38.8
1908	12	30	35.6
1909	01	3	40
1909	01	4	37.3
1909	11	10	35.9
1909	12	14	39.3
1909	12	29	36.7

Year	Month	Day	Temperature		Year	Month	Day	Temperature
1910	12	27	35.9		1919	12	22	37.8
1911	12	8	36.8		1920	11	24	36.7
1911	12	11	38.3		1921	03	25	37.3
1912	01	5	38.2		1922	01	5	36.1
1912	01	15	39.4		1922	11	3	35.6
1912	11	15	37.3		1922	11	14	37.4
1913	01	25	38.1		1922	12	10	35.1
1913	02	5	36.7		1922	12	24	39.8
1913	02	18	38.1		1922	12	30	38.6
1913	12	25	35.1		1923	01	15	39.3
1914	01	2	35.8		1923	02	18	38.8
1914	01	27	35.2		1923	02	23	38.2
1914	10	30	35.6		1923	03	12	35.4
1914	12	12	38.6		1923	03	30	37.6
1915	01	26	40.3		1923	11	27	37.7
1915	01	28	39.6		1923	12	15	36.8
1915	03	1	37.1		1924	01	9	36.7
					1924	01	10	36.4
1915	03	7	35.1					
1915	03	8	38.2		1925	01	28	36.4
1915	03	13	36.7		1925	11	29	36.1
1915	11	14	36.2		1925	12	19	40.2
1915	11	18	35		1926	01	13	39.9
1916	01	11	36.1		1926	01	27	35.5
1917	01	12	36		1926	01	28	38.3
1917	12	23	37.8		1926	02	8	42.1
1918	12	2	35.4		1926	02	15	39
1918	12	7	37.8		1926	02	17	40.6
1918	12	20	38.3		1926	03	10	38
1919	01	21	36.6		1926	10	20	35.4
1919	02	18	36.3		1926	10	23	36.2

Year	Month	Day	Temperature
1926	10	24	36.1
1926	11	23	35.7
1926	12	10	39.9
1927	02	5	36.4
1927	03	18	38.1
1927	10	19	36.8
1927	10	31	35
1928	01	1	38.1
1928	10	7	36.7
1928	11	7	36.1
1928	11	29	35.5
1928	11	30	37.6
1929	01	8	36.6
1929	01	9	41.2
1929	01	30	37.8
1929	12	9	36.9
1929	12	11	36.1
1930	01	2	35.4
1930	01	18	37.8
1930	02	22	41.1
1930	12	23	35.7
1931	01	11	36
1931	01	13	35.9
1931	02	20	40.1
1932	01	9	35.1
1932	01	22	40.9
1932	02	2	36.1
1932	02	20	38.1
1932	12	28	36.3
1933	01	11	38.6
1934	01	24	39.7
1934	01	25	35.7
1935	01	23	38.7
1935	10	27	35.3
1936	01	16	36.9
1936	10	8	35.9
1936	11	4	35.1
1936	11	5	36.2
1936	11	6	37.7
1937	01	19	36.7
1937	03	23	35.1
1937	12	13	35.7
1938	11	10	35.2
1938	12	5	36.2
1938	12	7	35
1938	12	10	36.8
1939	01	14	45.3
1939	02	14	38.8
1939	02	17	36.4
1939	12	4	36.6
1939	12	12	38.8
1940	01	25	41.3
1940	01	28	40.6
1940	01	29	35.1
1940	02	11	39.4
1940	03	28	38.7
1940	10	15	35.3
1940	11	11	35.1
1941	02	1	39.3
1941	11	19	35.2
1941	11	30	39.6

Year	Month	Day	Temperature
1941	12	27	37.5
1942	01	4	41.9
1942	01	8	40.4
1942	01	25	38.3
1942	10	4	37.4
1942	12	28	38
1943	02	6	37.3
1943	02	18	35.8
1944	01	23	39.4
1944	02	15	37.3
1944	10	9	35.2
1944	10	10	35.6
1944	10	14	35.6
1944	11	13	35.1
1944	11	16	37.7
1944	11	20	37.1
1945	11	3	35.2
1945	11	9	36.9
1945	12	17	38.8
1946	01	4	39
1946	01	5	39.8
1946	01	25	35.6
1946	02	1	38.4
1946	02	19	36.1
1946	10	13	35.7
1946	11	6	40.3
1946	11	27	35.9
1946	12	21	36.3
1946	12	29	35
1948	10	26	36.2
1948	10	27	35.2
1949	12	4	36.6
1949	12	24	35.8
1950	01	6	39.5
1950	12	8	36.8
1950	12	14	38.5
1951	02	13	35
1951	03	6	37.9
1951	11	3	35
1951	11	6	35.7
1952	01	11	35.1
1952	01	25	41
1953	11	15	36
1953	11	17	38
1953	12	21	41.9
1953	12	27	36
1954	02	18	36
1955	01	3	40.1
1956	12	19	35.6
1956	12	29	35.1
1956	12	30	36.3
1957	11	15	36.7
1957	11	24	38.4
1957	11	30	37.8
1957	12	2	37.5
1957	12	20	42.2
1957	12	25	38.4
1957	12	26	37.6

Year	Month	Day	Temperature
1958	02	27	36.4
1958	10	30	35.7
1960	01	25	39.4
1960	01	26	41.1
1960	01	27	42.4
1960	01	28	39.7
1960	03	31	35
1961	01	29	41.6
1962	02	8	36.9
1963	02	8	35.1
1963	12	25	36.7
1964	01	7	40.8
1964	11	26	38.3
1964	12	1	37.2
1965	03	6	38.8
1965	03	9	35.6
1965	11	5	37.9
1965	12	28	36.4
1966	03	9	35.8
1966	11	24	35.4
1966	11	30	35.1
1967	01	10	36.4
1967	01	20	37.1
1967	01	22	38.8
1967	11	13	35.8
1967	11	14	36.1
1968	02	1	36.3
1968	11	17	35.8
1969	01	8	38.9
1969	01	18	37.7
1969	12	19	35.2
1970	12	18	36
1971	12	4	35.2
1972	12	11	36
1972	12	15	37.3
1972	12	21	36.1
1972	12	23	39.9
1973	01	31	36.8
1973	02	4	36.3
1973	02	6	39.6
1973	11	20	36.2
1974	11	12	38.4
1975	01	2	39.6
1975	01	23	36.9
1975	11	20	37.4
1975	12	12	39.5
1976	12	3	36.7
1976	12	7	37.3
1977	01	1	36.9
1977	01	30	40.4
1977	02	1	41.4
1977	10	29	35.8
1977	12	10	37.2
1977	12	27	35.4
1978	01	15	37.4
1978	02	9	36.7
1978	02	11	37
1978	02	20	37.2
1979	01	10	39.6
1979	02	13	38.4
1979	12	2	36.4
1979	12	5	39.9

Year	Month	Day	Temperature	Year	Month	Day	Temperature
1979	12	8	38.3	1986	02	9	39.7
1979	12	16	38.3	1986	03	27	35.4
1979	12	23	37.1	1987	01	14	35.4
1980	01	18	39.3	1987	01	16	35.3
1980	02	21	41.3	1987	02	3	37
1980	02	24	35.3	1988	01	21	35.2
1980	03	19	37.3	1988	02	28	35
1980	11	14	38.1	1988	03	11	35
1980	11	18	39.2	1988	10	29	36.8
1980	11	27	38.5	1988	11	3	39.2
1981	03	20	35.4	1988	12	10	35
1981	12	5	38.8	1989	12	26	36.7
1981	12	7	35.7	1990	11	1	35.4
1982	02	9	37.9	1990	12	8	35.2
1982	02	16	36	1990	12	18	39.8
1982	11	25	41.8	1990	12	23	40
1983	01	9	40	1991	01	5	35.6
1983	01	10	35.6	1991	02	14	40.8
1983	03	9	39.8	1991	02	26	36.8
1983	12	21	35	1991	11	26	36.1
1983	12	25	37.9	1992	01	23	35.6
1984	01	25	36.3	1992	02	3	35.2
1984	02	12	35				
1984	02	13	35.9	1993	01	17	37
1985	01	9	36.1	1993	02	4	36
1985	03	2	37.8	1994	01	3	37.1
1985	03	4	35.4	1994	01	5	36
				1994	01	6	37.3
1985	12	20	39	1994	01	7	36.4
1985	12	21	36.4				

APPENDIX 2

Heat Related Illnesses (from Kilbourne, 1989)

Heatstroke occurs when perspiration and the vasomotor, haemodynamic, and adaptive behavioural responses to a heat stress are insufficient to prevent a substantial rise in core body temperature. A patient's condition is usually designated as heatstroke when rectal temperature rises to greater or equal to 105 F (40.6°C) as a result of high environmental temperatures (although standardised diagnostic criteria do not exist). Mental status is affected, and the patient may be delirious, stuporous, or comatose. Classically, sweating is said to be absent in heatstroke, but this is not always so. The outcome of heatstroke is often fatal, even with expert care. The death-to-case ratio in reported case series varied from 0 to about 40% and averaged about 15%.

Heat exhaustion is much less severe than heatstroke, and occurs due to a fluid and electrolyte imbalance due to increased perspiration in response to intense heat. Patients complain of dizziness, weakness, or fatigue. Body temperature may be normal or slightly to moderately elevated.

Heat syncope refers to the sudden loss of consciousness, usually associated with exercise, by persons who are not acclimatised to the hot weather. The cause is thought to be circulatory instability due to superficial vasodilation in response to the heat.

Heat cramps occur during exercise done by persons unaccustomed to the heat, and are thought to be due to mild fluid and electrolyte imbalances which generally cease to be a problem after acclimatisation.

APPENDIX 3

Total Sum of Squares for Sydney and Broken Hill (Involved in calculation of threshold temperature)

Sydney

The Threshold temp: 25.0000
TSS <1YEAR 6892.68
TSS 1-9 2167.63
TSS 10-19 3839.64
TSS 20-29 8885.28
TSS 30-39 9099.92
TSS 40-49 14865.2
TSS 50-59 43205.9
TSS 60+ 646407.
TSS TOTAL 778794.

The Threshold temp: 26.0000
TSS <1YEAR 6985.40
TSS 1-9 2232.24
TSS 10-19 3880.09
TSS 20-29 9098.45
TSS 30-39 9183.31
TSS 40-49 15117.6
TSS 50-59 43606.3
TSS 60+ 674527.
TSS TOTAL 809182.

The Threshold temp: 27.0000
TSS <1YEAR 7080.10
TSS 1-9 2267.50
TSS 10-19 3914.73
TSS 20-29 9115.01
TSS 30-39 9394.57
TSS 40-49 15292.9
TSS 50-59 44465.7
TSS 60+ 692380.
TSS TOTAL 829609.

The Threshold temp: 28.0000
TSS <1YEAR 7221.21
TSS 1-9 2289.28
TSS 10-19 4001.96
TSS 20-29 9266.14
TSS 30-39 9515.80
TSS 40-49 15453.9
TSS 50-59 45079.8
TSS 60+ 712009.
TSS TOTAL 851897.

The Threshold temp: 29.0000
TSS <1YEAR 7326.41
TSS 1-9 2309.27
TSS 10-19 4050.23

TSS 20-29 9468.74
TSS 30-39 9672.05
TSS 40-49 15676.3
TSS 50-59 45803.5
TSS 60+ 725856.
TSS TOTAL 867654.

The Threshold temp: 30.0000
TSS <1YEAR 7331.26
TSS 1-9 2338.26
TSS 10-19 4080.29
TSS 20-29 9516.35
TSS 30-39 9698.61
TSS 40-49 15799.3
TSS 50-59 46237.6
TSS 60+ 728170.
TSS TOTAL 868724.

The Threshold temp: 31.0000
TSS <1YEAR 7426.68
TSS 1-9 2358.11
TSS 10-19 4113.07
TSS 20-29 9569.09
TSS 30-39 9837.21
TSS 40-49 15870.9
TSS 50-59 46584.1
TSS 60+ 733511.
TSS TOTAL 877014.

The Threshold temp: 32.0000
TSS <1YEAR 7420.81
TSS 1-9 2351.89
TSS 10-19 4114.28
TSS 20-29 9583.76
TSS 30-39 9840.54
TSS 40-49 15977.6
TSS 50-59 46505.3
TSS 60+ 734581.
TSS TOTAL 877436.

The Threshold temp: 33.0000
TSS <1YEAR 7441.74
TSS 1-9 2360.33
TSS 10-19 4114.02
TSS 20-29 9580.56
TSS 30-39 9836.40
TSS 40-49 15995.0
TSS 50-59 46532.4
TSS 60+ 733713.

TSS TOTAL 876443.

The Threshold temp: 34.0000
TSS <1YEAR 7450.67
TSS 1-9 2369.67
TSS 10-19 4119.98
TSS 20-29 9566.79
TSS 30-39 9859.71
TSS 40-49 15989.6
TSS 50-59 46636.9
TSS 60+ 735631.
TSS TOTAL 877560.

The Threshold temp: 35.0000
TSS <1YEAR 7440.49
TSS 1-9 2371.53
TSS 10-19 4123.92
TSS 20-29 9626.63
TSS 30-39 9839.71
TSS 40-49 16015.4
TSS 50-59 46650.6
TSS 60+ 736350.
TSS TOTAL 879107.

The Threshold temp: 36.0000
TSS <1YEAR 7454.53
TSS 1-9 2376.23
TSS 10-19 4134.21
TSS 20-29 9634.81
TSS 30-39 9873.56
TSS 40-49 16010.6
TSS 50-59 46725.9
TSS 60+ 734310.
TSS TOTAL 875967

The Threshold temp: 37.0000
TSS <1YEAR 7460.33
TSS 1-9 2379.34
TSS 10-19 4133.76
TSS 20-29 9625.41
TSS 30-39 9885.03
TSS 40-49 16001.8
TSS 50-59 46754.9
TSS 60+ 736910.
TSS TOTAL 879665.

The Threshold temp: 38.0000
TSS <1YEAR 7465.62
TSS 1-9 2377.25

TSS 60+ 737397.
TSS TOTAL 880432.

The Threshold temp: 43.0000
TSS <1YEAR 7470.15
TSS 1-9 2381.75
TSS 10-19 4140.56
TSS 20-29 9644.51
TSS 30-39 9905.08
TSS 40-49 16057.3
TSS 50-59 46839.6
TSS 60+ 737435.
TSS TOTAL 880516.

The Threshold temp: 44.0000
TSS <1YEAR 7470.15
TSS 1-9 2381.75
TSS 10-19 4140.56
TSS 20-29 9644.51
TSS 30-39 9905.08
TSS 40-49 16057.3
TSS 50-59 46839.6
TSS 60+ 737435.
TSS TOTAL 880516.

The Threshold temp: 45.0000
TSS <1YEAR 7470.15
TSS 1-9 2381.75
TSS 10-19 4140.56
TSS 20-29 9644.51
TSS 30-39 9905.08
TSS 40-49 16057.3
TSS 50-59 46839.6
TSS 60+ 737435.
TSS TOTAL 880516.

The Threshold temp: 46.0000
TSS <1YEAR 7470.15
TSS 1-9 2381.75
TSS 10-19 4140.56
TSS 20-29 9644.51
TSS 30-39 9905.08
TSS 40-49 16057.3
TSS 50-59 46839.6
TSS 60+ 737435.
TSS TOTAL 880516.

The Threshold temp: 47.0000
TSS <1YEAR 7470.15

TSS 1-9 2381.75
TSS 10-19 4140.56
TSS 20-29 9644.51
TSS 30-39 9905.08
TSS 40-49 16057.3
TSS 50-59 46839.6
TSS 60+ 737435.
TSS TOTAL 880516.

Broken Hill

The Threshold temp: 22.0000
TSS <1YEAR 42.6612
TSS 1-9 13.9502
TSS 10-19 34.7997
TSS 20-29 45.4889
TSS 30-39 52.4269
TSS 40-49 70.7143
TSS 50-59 267.063
TSS 60+ 2680.48
TSS TOTAL 3265.75

The Threshold temp: 23.0000
TSS <1YEAR 41.6826
TSS 1-9 13.9469
TSS 10-19 32.8274
TSS 20-29 42.5608
TSS 30-39 48.5286
TSS 40-49 67.7405
TSS 50-59 261.258
TSS 60+ 2681.56
TSS TOTAL 3255.56

The Threshold temp: 24.0000
TSS <1YEAR 41.6849
TSS 1-9 11.9636
TSS 10-19 34.7974
TSS 20-29 44.5128
TSS 30-39 52.4319
TSS 40-49 73.5958
TSS 50-59 263.061
TSS 60+ 2685.39
TSS TOTAL 3259.14

The Threshold temp: 25.0000
TSS <1YEAR 41.6825
TSS 1-9 13.9517
TSS 10-19 32.8259
TSS 20-29 43.5345
TSS 30-39 52.4265
TSS 40-49 68.7186
TSS 50-59 262.331
TSS 60+ 2737.70
TSS TOTAL 3312.47

The Threshold temp: 26.0000
TSS <1YEAR 41.6850
TSS 1-9 13.9495
TSS 10-19 20.8885

TSS 20-29 44.5161
TSS 30-39 52.4267
TSS 40-49 72.6533
TSS 50-59 257.811
TSS 60+ 2728.66
TSS TOTAL 3260.46

The Threshold temp: 27.0000
TSS <1YEAR 41.6861
TSS 1-9 12.9573
TSS 10-19 34.8025
TSS 20-29 45.5028
TSS 30-39 51.4528
TSS 40-49 70.7379
TSS 50-59 261.604
TSS 60+ 2752.16
TSS TOTAL 3327.41

The Threshold temp: 28.0000
TSS <1YEAR 40.7037
TSS 1-9 13.9484
TSS 10-19 31.8381
TSS 20-29 43.5494
TSS 30-39 52.4218
TSS 40-49 70.7309
TSS 50-59 265.003
TSS 60+ 2748.65
TSS TOTAL 3322.39

The Threshold temp: 29.0000
TSS <1YEAR 38.7070
TSS 1-9 12.9575
TSS 10-19 34.7976
TSS 20-29 41.5819
TSS 30-39 48.4859
TSS 40-49 70.7421
TSS 50-59 239.706
TSS 60+ 2763.05
TSS TOTAL 3273.79

The Threshold temp: 30.0000
TSS <1YEAR 42.6689
TSS 1-9 13.9492
TSS 10-19 34.8027
TSS 20-29 45.4891
TSS 30-39 50.4871
TSS 40-49 69.7581
TSS 50-59 261.680
TSS 60+ 2753.58

TSS TOTAL 3313.58

The Threshold temp: 31.0000
TSS <1YEAR 41.6879
TSS 1-9 13.9454
TSS 10-19 34.8050
TSS 20-29 45.5013
TSS 30-39 53.4106
TSS 40-49 72.6448
TSS 50-59 266.294
TSS 60+ 2778.38
TSS TOTAL 3361.25

The Threshold temp: 32.0000
TSS <1YEAR 42.6646
TSS 1-9 12.9541
TSS 10-19 32.8286
TSS 20-29 45.5079
TSS 30-39 53.3985
TSS 40-49 73.6188
TSS 50-59 267.120
TSS 60+ 2724.87
TSS TOTAL 3312.63

The Threshold temp: 33.0000
TSS <1YEAR 38.7077
TSS 1-9 13.9445
TSS 10-19 33.8102
TSS 20-29 45.5148
TSS 30-39 52.4225
TSS 40-49 73.6339
TSS 50-59 265.211
TSS 60+ 2771.99
TSS TOTAL 3354.30

The Threshold temp: 34.0000
TSS <1YEAR 42.6681
TSS 1-9 13.9383
TSS 10-19 33.8023
TSS 20-29 42.5798
TSS 30-39 53.3762
TSS 40-49 72.6797
TSS 50-59 269.024
TSS 60+ 2791.87
TSS TOTAL 3377.44

The Threshold temp: 35.0000
TSS <1YEAR 42.6569
TSS 1-9 13.9275

TSS 10-19 34.7901
TSS 20-29 45.5109
TSS 30-39 52.3845
TSS 40-49 72.6687
TSS 50-59 261.492
TSS 60+ 2762.41
TSS TOTAL 3329.60

The Threshold temp: 36.0000
TSS <1YEAR 42.6426
TSS 1-9 13.9135
TSS 10-19 34.7962
TSS 20-29 45.5190
TSS 30-39 51.4322
TSS 40-49 72.6660
TSS 50-59 269.953
TSS 60+ 2778.74
TSS TOTAL 3364.08

The Threshold temp: 37.0000
TSS <1YEAR 39.7291
TSS 1-9 11.9579
TSS 10-19 34.8025
TSS 20-29 45.5155
TSS 30-39 47.5187
TSS 40-49 72.6555
TSS 50-59 270.841
TSS 60+ 2771.51
TSS TOTAL 3357.54

The Threshold temp: 38.0000
TSS <1YEAR 42.6646
TSS 1-9 13.9331
TSS 10-19 34.8058
TSS 20-29 45.4945
TSS 30-39 52.4415
TSS 40-49 71.6991
TSS 50-59 269.046
TSS 60+ 2804.99
TSS TOTAL 3392.71

The Threshold temp: 39.0000
TSS <1YEAR 42.6539
TSS 1-9 9.96982
TSS 10-19 34.8090
TSS 20-29 44.5292
TSS 30-39 52.4346
TSS 40-49 71.7361
TSS 50-59 269.207

TSS 60+ 2825.75
TSS TOTAL 3389.80

The Threshold temp: 40.0000
TSS <1YEAR 41.6876
TSS 1-9 13.9569
TSS 10-19 34.8120
TSS 20-29 45.4722
TSS 30-39 53.4141
TSS 40-49 73.6336
TSS 50-59 272.603
TSS 60+ 2821.94
TSS TOTAL 3410.26

The Threshold temp: 41.0000
TSS <1YEAR 41.6940
TSS 1-9 13.9566
TSS 10-19 34.8142
TSS 20-29 43.5694
TSS 30-39 53.4205
TSS 40-49 73.5454
TSS 50-59 270.874
TSS 60+ 2814.03
TSS TOTAL 3405.95

The Threshold temp: 42.0000
TSS <1YEAR 42.6762
TSS 1-9 13.9571
TSS 10-19 34.8132
TSS 20-29 45.5252
TSS 30-39 53.4251
TSS 40-49 72.6707
TSS 50-59 271.847
TSS 60+ 2837.84
TSS TOTAL 3427.67

The Threshold temp: 43.0000
TSS <1YEAR 42.6770
TSS 1-9 13.9569
TSS 10-19 34.8143
TSS 20-29 45.5274
TSS 30-39 53.4278
TSS 40-49 72.7080
TSS 50-59 272.392
TSS 60+ 2839.76
TSS TOTAL 3430.42

APPENDIX 4

Consequences of Heatwaves Documented in *The Sydney Morning Herald,* 1803-83

A. SICKNESS

1. Melbourne- fire and sickness prevailed after 3-4 days of excessive heat- SMH19/1 1854-2c
2. Bathurst- many people suffering from diarrohoea after 3 very hot days- SMH 17/1 1857-4e
3. Around Brisbane- great deal of sickness among all ages- SMH 18/4 1859-5a
4. Deniliquin- diptheria has appeared- SMH 7/2 1860-3F
5. Deniliquin- a great deal of sickness especially among children- SMH 25/1 1862-7a, and also SMH 5/2 1862-8b
6. Sydney- high heat and humidity caused marked increase in Skin complaints, gastric trouble - SMH 2/3 1858-3
7. Sydney- heat influenza affecting many- SMH 29/1 1960-4

B. OTHER HUMAN EFFECTS

1. Hot nights- people sleeping on the beaches in Adelaide and Melbourne- SMH 11/1 1939-15h,16a
2. Adelaide- police blame heat for record number of calls to husband and wife disputes- SMH 22/1 1973-3

C. EFFECT OF AIR CONDITIONING

1. Hay- owners of AC opened their homes to all babies, and saved dozens of babies from heat exhaustion- SMH 18/1 1960-1
2. 6 heatstruck babies recovered in AC hospital wards- SMH 28/1 1960-4

D. FOOD SHORTAGES AND PRICE INCREASES

1. Townsville- milk shortages and vegetable prices have increased by up to 400%- SMH 10/1 1939-13h
2. NSW- Milk yields dropping and prices increasing- SMH 5/1 1946-1
3. Sydney- prices of green vegetables would be "forced up"- SMH 22/12 1953-1

E. WATER

1. WATER CONSUMPTION

a) Adelaide- water consumption increased from 16.5 million gallons a day to 40 million- SMH 31/12 1931-10c

b) Perth- 20 million gallons of water consumed daily- SMH 12/12 1931-14g

c) Canberra- consumption has neary doubled since the heatwave began- SMH 11/1 1939-15h,16a

d) Sydney- record consumption of 230 million gallons- SMH 28/10 1948-3

e) Sydney- according to the Metropolitan Water Board Consumption for previous 7 days was the highest ever recorded at 1607.2 million gallons- SMH 18/11 1953-1

f) Sydney- very high water consumption- SMH 4/1 1955-1,4

g) Perth- all time record consumption of 81 287 000 gallons - SMH 13/1 1956-4

h) Sydney- record April consumption of 225.6 million gallons - SMH 14/4 1957-29

i) Sydney- 275 million gallons used compared with previous years Oct average of 191 million gallons and highest consumption of 248 million gallons -SMH 11/10 1957-1

j) Sydney-307 million gallons of water used. 100 million more than usual- SMH 22/ 1973-3

k) Melbourne- water consumption rose rapidly- SMH 22/1 1973-3

2. WATER SHORTAGE

a) Canberra- the possibility of imposing water restrictions is being considered- SMH 11/1 1939-15h,16a

b) Ivanhoe- water is being brought from Menindie at a cost of 1/6 a 100 gallons, and ice is being brought from Broken Hill at a cost of 8/ a hundreth weight- SMH 11/1 1939-15h,16a

c) Adelaide-ice is being rationed in some districts- SMH 11/1 1939-15h,16a

3. WATER RESTRICTIONS

a) Sydney- record consumption of 230 million gallons restrictions in some areas (see reference)- SMH 28/10 1948-3

b) Water Board banned the use of fixed hoses in Manly Warringah- SMH 31/10 1958-1

4. WATER SUPPLY FAILURE

a) Water supplies failed at Arcadia, Orchard Hills and Plumpton- SMH 22/1 1953-1

b) Sydney- very high water consumption- some areas without water- SMH 4/1 1955-1,4

c) Sydney- some areas without water- SMH 11/10 1957-1

d) Sydney- water supply failed in many suburbs for up to 11 hours- SMH 31/10 1958-1

e) Sydney- widespread water failure- SMH 28/1 1960-1

f) Temporary failures at Lugarno and Auburn- SMH 30/1 1961-1,8

F. BUSINESS

1. RESTRICTIONS / PROBLEMS DUE TO HEAT

a) Adelaide- very hot and very little business doing- SMH 17/1 1859-5d
b) The Lachlan- farm workers desisted between 1-5pm- SMH 8/2 1860-5e
c) Adelaide- very hot and very little bussiness doing- SMH 10/1 1861-4d
d) Rockhampton- midday work suspended during hot period- SMH 6/3 1866-5b
e) Adelaide- several factories and businesses closed early, and some will stay closed tommorrow. General Motors Holden closed at 3pm but employees will recieve a full days wageSMH 11/1 1939-15h,16a.
f) Melbourne- blacksmiths given time off work- SMH 20/1 1908-8b
g) Sydney- 500 waterside workers walked off - up to 44C inside ships- some ships sprayed on the side to cool them downlater decided that " men not required to work extra shift due to heat"- SMH 26/1 1960-12
h) Sydney- many factories and offices closed before noon due to heat and absenteeism- SMH 28/1 1960-1
i) Wharf labourers stopped work-SMH 28/1 1960-1
j) Fifteen Overseas and interstate ships were delayed due to loading delays- SMH 29/1 1960-1
k) Melbourne - more than 1000 waterside workers stopped work when temps topped 37.7C- SMH 8/2 1962-6
l) Sydney- factories and department stores closed at lunchtime due to heat- SMH 6/2 1973-1
m) Sydney- wharf workers stop work again- SMH 6/2 1973-1

2. FACTORY CONDITIONS

a) Parramatta- 54.5F in the square of a factory- SMH 17/12 1853-7d
b) Temp in the workshop of J.Shearer and sons was 51.7F- SMH 11/1 1939-15h,16a
c) North Sydney- a printing office was closed with an inside temp of 48.9C. The heat shrank printing paper- SMH 27/1 1960-1
d) Pagewood- 50C inside a motor plant- SMH 28/1 1960-1
e) Lidcombe- 45C recorded inside an aircraft factory- SMH 27/1 1960-1

3. INCREASED SALES

a) Sydney-
    1) steady rush for cold drinks and ice creams, hotels well frequented- SMH 5/2 1949-11.
    2) Many milkbars sold out of soft drinks and ice cream by the afternoon- SMH 7/2 1949-1
    3) "Beer Scare" due to excess demand and low supply-SMH 15/1 1949-1
b) Sydney-
    1) increased sale of hats and cool clothes- SMH 9/12 1850-1
    2) milk bar business up by 100%- SMH 9/12 1850-1
c) Sydney- milkbars reported record trade- SMH 22/12 1953-1
d) Sydney-
    1) hotels ran out of beer- SMH 4/1 1955-1,4

2) milk bars ran out of supplies of milk, drink and ice creamone ran out by 9am- SMH 4/1 1955-1,4

e) Sydney- increased sale of salt tablets- by up to 1000%. Emergency supplies being shipped from Melbourne- SMH 29/1 2960-4

f) Sydney- soft drink factories at maximum production- SMH 31/1 1960-9

g) Sydney- fans sold out- SMH 31/1 1960-9

G. ECONOMIC CONSEQUENCES

1. from 180 000 to 250 000 Queensland- loss of stock and damages to crops are estimated at costing the primary producer pounds- SMH 31/1 1940-14

H. TRAINS

1. Townsville- 3 trains delayed for 2 hrs due to buckled rails-SMH 12/3 1946-3
2. Sydney- rails buckled on several suburban services causing delays- SMH 22/12 1953-1
3. Sydney- Buckled rails on north and south coast lines delayed trains by 30 mins- SMH 21/12 1957-1
4. Granville-rail buckled resulting in a train colliding with the platform- caused disorganisation among electric train services for 2.5 hours-SMH 31/10 1958-1
5. Sydney- buckled lines at Normanhurst and 30 feet of buckled lines at Narwee (East Hills System) and a points failure on the North Shore disrupted services. Gallons of water were poured on the track at Normanhurst- SMH 27/1 1960-1
6. Sydney- buckled lines at St Allawah, St Peters, Gordon,Normanhurst- SMH 28/1 1960-1
7. Lines buckled at Beecroft and Macdonaldtown- SMH 29/1 1960-4
8. Train delayed for 10-15 mins when lines buckles and 12 signals failed- SMH 30/1 1961-1,8

I. CAR BREAKDOWNS

1. NRMA STATISTICS

a) Sydney- NRMA assisted around 500 motorists with breakdowns due to vapour locks in petrol feed lines- SMH 9/12 1850-1

b) Sydney- NRMA unable to keep up with demands-more than 1100 calls by 8pm- mostly caused by vapourised petrol blocking fuel systems- SMH 18/11 1957-1

c) Sydney- NRMA 2000 calls for assistance- worst period 2-4pm90 % of calls were for vapour locks- SMH 21/12 1957-1

d) Sydney- NRMA answered thousands of calls- SMH 28/1 1960-1

e) Sydney- 1486 calls by 6pm- double the average- SMH 30/1 1961-1,8

f) Sydney- 815 calls- 300 more than usual- SMH 22/1 1973-3

2. OTHER
   a) Sydney-
      1) many flat tyres as heat caused air to expand and defective valves broke- SMH 22/12 1953-1
      2) radiators boiled- SMH 22/12 1953-1
   b) Ambulances broken down due to fuel blockages- SMH 27/1 1960-1

J. ROADS AND BRIDGES
1. Sydney Harbour Bridge- 13in longer than 6 months ago- SMH 9/12 1850-1
2. Gladesville Bridge-
   a) Jammed open between 4.45pm- 6.25 pm when the metal expanded.
   b) Caused one of the worst traffic jams seen in Sydney- traffic was banked back to Pyrmont Bridge- SMH 18/11 1957-1
3. Sydney- traffic jams on Pacific Highway, Harbour Bridge and roads to Gladesville Bridge due to car breakdowns and bridge jamming open- SMH 18/11 1957-1
4. Gladesville Bridge jammed open (about 12ft from fully closed position), 15 mins after it was opened. It was jammed from 3.30 to 5.20pm. Firemen hosed it till it could close. The bridge has a normal 4inch clearance - SMH 27/1 1960-1
5. Sydney Harbour Bridge- rose 4in, and expanded 9.5in. The Bridge is made to cope with a rise or fall from average min/ max temps of 15.5C-SMH 31/1 1960-9
6. Glebe island, Gladesville and Pyrmont Bridges were hosed by workmen to prevent them buckling- SMH 30/1 1961-1,8

K. ROAD MATERIALS
1. Hay- soggy bitumen roads- SMH 18/1 1960-1
2. Sydney- car wheels spun in soft bitumen- SMH 27/1 1960-1
3. Mascot- bitumen hosed down to prevent passengers burning their feet as they boarded planes- SMH 27/1 1960-1
4. Sydney- a man burnt his foot after loosing his shoe in melted bitumen- SMH 27/1 1960-1
5. Sydney- women lost stilettos in melted bitumen- SMH 27/1 1960-1

L. FURNITURE
1. Furniture not in sun "disagreeably hot"- Goulburn- SMH 14/2 1851-2f
2. Lower Murrumbidgee- furniture hot too touch- SMH 18/2 1860-7f
3. Murrumbidgee- 14 days of excssive heat -max temp was 48F- everything very hot- handles, glasses etc.- SMH 29/1-1862-5e,f
4. Sydney- furniture, bedding and floors hot to the touch- SMH 16/1 1939-12b

M. AGRICULTURAL

1. DAMAGE TO CROPS (1823- 1866, 1939)
   a) Windsor- SMH 12/1 1843-3c
   b) Windsor- SMH 5/2 1849-3a
   c) Windsor- SMH 24/10 1849-2g
   d) Wollombi- SMH 27/12 1849-2f
   e) Windsor- SMH 1/1 1850-2f
   f) Camden- SMH 12/1 1850-3c
   g) Goulburn- SMH 30/11 1850-4c
   h) Camden- SMH 11/1 1851-5c
   i) Parramatta- SMH 10/2 1851-2f
   j) Hexham- SMH 4/2 1853-2f
   k) Braidwood- SMH 6/1 1854-3h
   l) Braidwood-SMH 15/11 1855-8a
   m) Campbelltown, Hunter District, Singelton- SMH 19/11 1855-2f,3a,c
   n) Windsor- SMH 20/11 1855-2a
   o) Gundaroo- SMH 4/12 1855-2d
   p) Windsor- SMH 14/1 1858-3a
   q) Yass- SMH 31/1 1860-3b
   r) Carcoar- SMH 26/11 1861-3f
   s) Bathurst- SMH13/1 1862-8c
   t) Braidwood- SMH 9/1 1864-6f
   u) Sydney?- SMH 22/12 1953-1

2. STOCK LOST (1823-1866, 1905-)
   a) Goulburn SMH 2/2 1848-2g
   b) Lower Murrumbidgee- SMH 17/2 1857-5b
   c) Deniliquin- SMH 7/2 1850-3f
   d) Cobar- SMH 6/2 1939-7b
   e) Parramatta-SMH 3/1 1905-6f
   f) Newcastle- SMH 6/1 1909-10e
   g) Homebush- SMH 28/2 1911-9f
   h) Queensland- estimated that 50 000 fowls died thru stateloss of aprox 12 500 pounds to poultry owners- SMH 30/1 1940-9
   i) Sydney??- SMH 22/12 1953-1
   j) Flemington- SMH 28/1 1960-4

3. POSITIVE IMPACTS (1823-1866, 1939)
   a) Camden- Good for wine- SMH 11/11 1851-5c
   b) Moreton Bay- Vegetable produce growing amazingly fast- SMH 2/1 1857-5b
   c) Shoalhaven- Maize promises to be a good crop after 2 days of 32.5F- SMH 16/2 1859-3f

N. EFFECT ON ANIMALS

1. Two horses died running the Newcastle Mail- SMH 6/2 1855-5b.
   Nb. this is not an isolated incidence- many horses collapsed and/ or died while running the mail or working as coach horses.
2. Lake Hope- Millions of fish killed by the heat- SMH 28/3 1863-7f
3. Leeton- dead fish in the Murrumbidgee whose waters are luke warm- SMH 11/1 1939-15h,16a
4. Castle Hill- Koala Park- bears sprawled in exhaustion- sprinklers sprayed on eucalypts all the time- SMH 14/1 1939-11f
5. Isisford, Queensland- lack of natural shade meant birds were baked under galvanised iron or boiled in drains- hundreds perished- SMH 23/2 1932-13c

O. OTHER

1. Melbourne- trees planted in streets to "ward off' sunstroke- SMH 10/3 1855-6f
2. The Lachlan- water in bland creek evaporated 29in in 24 hours with a fall of 29in in a mile- SMH 8/2 1860-5e
3. Pilots reportes unusually high temps in the atmosphers up to 12500 ft- SMH 11/1 1939-15h,16a and SMH 13/1 1939-11e.
4. Trangie- motors in several large refrigerators burnt out- a max of 44.5 was recordered- SMH 22/1 1952-3
5. Car windscreens shatteres due to expansion of air inside- SMH 28/1 1960-4
6. PAN AM jet delayed at Kingsford Smith for 3 hours due to heat- air too thin and runway too short- SMH 29/1 1960-4
7. GPO weather service answered 131 928 calls; 65000 2 days prior, and less than 6000 the week before- SMH 29/1 1960-4
8. Sydney- cream filling of biscuits melted, as did floor and boot polishes- SMH 31/1 1960-9
9. Pianos out of tune due to expanded strings- SMH 31/1 1960-9
10. RSPCA- received many calls for advice in cooling pets- SMH 31/1 1960-9