



Frank Alban MLA

Member for Swan Hills

11 June 2010

PUBLIC

Hon Brian Ellis MLC
Chairman
Standing Committee on Environment & Public Affairs
Parliament house
PERTH W.A. 6000



SUBMISSION - AIR COOLING IN SCHOOLS

This submission affects the most vulnerable of my constituents, primary school children.

For the school week Monday 22 – 26 February 2010 Bureau of Meteorology temperatures were 34.8°, 37.2°, 39.4°, 41.8° and 39.9°. Of the 20 school days in February alone, 19 days were over 27°, the point at which research shows performance is significantly worse. 16 days were over 30°. (See attached BOM temperature statistics).

Can you imagine sitting in a class room with 32 students, five days in a row at these temperatures, with only a fan for relief? There are approximately 55 summer school days in Western Australia.

In schools with no air cooling such as Ellen Stirling Primary School in Ellenbrook, teachers are required to organise lessons according to temperature which means active learning in the mornings and passive activities (watching a DVD) in the afternoons. Research shows student learning is optimum at temperatures ranging between 22-23°.

It is no longer school policy to send primary school children home in extreme temperatures. Now, it is at parents' discretion to keep their children home in extreme temperatures if they choose, however many families with both parents working do not have this option and have to leave their child/children at school.

2010, and in light of recent and predicted climate change, it is unacceptable to expect primary school children to learn in extreme temperatures, without the aid of air cooling.

Ellen Stirling Primary School is a new school commissioned in 2008 and built without additional air cooling. When temperatures reach 37°, current instructions (based on an indefensible policy dating back to 1974) are to employ passive cooling which means opening windows and turning on fans. During summer days when hot easterlies are blowing across sand plains into Ellenbrook, opening windows is not an option; there are no fly screens on the windows at this new school. Newly constructed schools do not have the benefit of established trees for shade (passive cooling).

The '25 Relative Strain Index' policy indicates all public primary schools located in Ellenbrook are not eligible for air cooling however **it is my understanding that this is only a guideline not a demarcation line.**

Swan Hills includes:

- Aveley
- Bailup
- Baskerville
- Belhus
- Brigadoon
- Bullsbrook
- Ellenbrook
- Gidgegannup*
- Glen Forrest
- Henley Brook*
- Herne Hill*
- Hovea
- Lexia
- Mahogany Creek
- Melaleuca
- Middle Swan*
- Millendon*
- Mundaring*
- Parkerville
- Stoneville
- The Vines
- Upper Swan
- Wooroloo

*Part suburbs

For example, Upper Swan Primary School is 2 kilometres from Ellenbrook and yet was allocated air cooling based on policy guidelines (i.e. temperatures) therefore Ellenbrook, which experiences the same temperatures (refer BOM statistics) should also be eligible for air cooling.

At Ellenbrook Secondary College, high school students are regularly sent home in summer with nose bleeds, dehydration and headache due to extreme temperatures, even sick rooms are not air cooled . A teacher at this school has sent me a photo (attached) which clearly shows two rubber thumb sorters which had melted due to the intensity of heat! They were in her desk drawer. In senior schools where class rooms and offices have large numbers of computers and office equipment, additional heat is generated by electronic equipment and yet few of these areas are not air cooled.

In the Dept. Ed/Dept. Housing & Works Policy on Air cooling in Government Schools, November 2002, Criterion 3 (Micro Environment) states "*There may be special cases of schools with abnormal climatic and/or environmental factors that adversely affects their micro environment, including topography and factors which affect the wellbeing of students and teachers*". I believe Ellenbrook is a case in point, in particular due to its inland location on flat sand plains which intensifies heat. In summer, ambient air temperatures in Ellenbrook exceed metropolitan area readings. We do not have the benefit of a sea breeze that Metropolitan and coastal strip areas do.

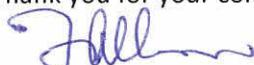
Costing estimates for supply and installation of air cooling at Ellen Stirling Primary School, commissioned in 2008 without air cooling, is between \$80 – 100,000.00 (not including administration, music or library areas), an exorbitant amount of funds for a school community to raise and an extra financial burden on families in Ellenbrook with a demographic of predominantly young families, many on single parent incomes struggling to maintain a reasonable standard of living. The majority of workers in Ellenbrook also have to travel far afield due to lack of local work.

I implore the committee to consider the points above, and recommend the Department of Education include Ellenbrook in the Relative Strain Index Guideline Air Cooling area.

The lack of air cooling in some schools in Ellenbrook is a matter of great concern for me as a parent and Member of Parliament representing families and school communities in Ellenbrook, particularly in light of State Government's commitment to two new schools adjacent to Ellenbrook at Aveley and Malvern Springs, due for completion by 2012 school year. In addition 15 new classrooms are scheduled for Arbor Grove and Ellenbrook Primary schools, all without air cooling.

All schools should be equal in having a comfortable learning environment which encourages optimum performance.

Thank you for your consideration of this submission.



Yours sincerely
Frank Alban MLA



rubber thumb sorters in desk drawer.- melted due
to extreme heat.

Photo from Beverley Day
Teacher at Ellenbrook Secondary College.

Pearce RAAF Base, Western Australia

February 2010 Daily Weather Observations

Most observations from Pearce RAAF Base, but some from Perth Airport.

can't get this for Upper Swan
(i.e. not available)
station was closed 1998



Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours	km/h	local	°C	%	eighths	km/h	hPa	°C	%	eighths	km/h	hPa			
1	Mo	16.9	35.8	0		12.7	SW	48	18:03	25.3	33	3	E	15	1009.9	33.6	26	1	SW	30	1006.1
2	Tu	16.5	31.1	0		11.2	SSW	50	17:05	20.7	51	4	SSE	19	1008.9	28.7	42	0	SW	33	1007.6
3	We	10.3	28.0	0		12.9	SSW	44	17:57	18.6	33	1	SSE	26	1017.9	26.8	14	1	SE	20	1015.1
4	Th	14.6	29.3	0		12.5	ESE	61	01:42	19.9	36	4	E	22	1018.7	28.0	14	5	ESE	15	1013.2
5	Fr	8.9	35.8	0		9.5	WSW	39	13:13	25.8	22	3	NE	13	1009.3	33.3	12	4	SSW	19	1005.1
6	Sa	15.0	26.4			6.6	WSW	44	13:38	21.6	58	1	W	15	1009.2	24.4	39		W	22	1009.5
7	Su	18.0	28.5			9.9	WSW	33	15:48	20.6	75	1	WSW	9	1015.7	27.8	37		WSW	22	1014.1
8	Mo	16.9	37.9	0.2		10.1	SSW	46	13:50	28.5	32	5	ENE	13	1014.6	34.8	23	5	SW	30	1010.3
9	Tu	15.5	37.5	0		12.2	W	48	13:31	32.9	30	1	NNE	20	1010.5	32.1	33	1	WNW	24	1011.1
10	We	19.9	26.7	0		3.8	SW	37	17:10	21.2	81	8	W	13	1016.1	26.2	59	6	WSW	19	1014.2
11	Th	19.4	28.1	0		7.4	SW	35	17:30	21.6	80	8	SSE	6	1016.0	27.4	57	3	W	19	1013.8
12	Fr	16.5	35.0	0		12.3	WSW	44	14:07	25.4	61	2	SSW	13	1013.7	33.5	35		SW	33	1010.3
13	Sa	18.8	34.6	0		12.9	E	52	01:29	24.1	46		E	22	1012.7	33.2	20		SE	15	1008.8
14	Su	15.6	38.5	0		11.5	E	44	05:16	28.5	34		ENE	30	1009.4	37.8	19		SW	30	1006.2
15	Mo	15.5	34.9	0		11.5	WSW	41	14:38	26.0	45	6	S	9	1008.2	31.1	33	5	WSW	28	1007.4
16	Tu	17.8	32.7	0		10.6	E	50	23:16	23.5	57	5	SSW	13	1014.1	31.8	37	6	W	22	1012.2
17	We	20.8	35.7	0		10.0	E	52	00:13	24.5	57	5	E	20	1014.8	34.7	24	1	WSW	13	1011.6
18	Th	14.2	39.5	0		11.6	SW	39	12:57	28.4	47		E	7	1013.4	34.0	31	3	WSW	28	1011.3
19	Fr	15.9	30.5	0		6.4	SW	37	13:03	22.5	69	5	W	9	1015.9	28.6	39	7	WSW	28	1014.0
20	Sa	15.2	31.7	0		9.3	SW	43	13:25	23.9	49		ESE	17	1016.8	28.5	41		SW	28	1014.6
21	Su	15.2	32.2	0		12.1	E	44	15:21	23.4	53		E	17	1017.7	31.4	26		S	11	1014.1
22	Mo	17.7	34.8	0		12.1	E	54	08:29	24.4	38	4	E	20	1018.1	34.1	21	3	SE	20	1014.2
23	Tu	17.1	37.2	0		10.9	ESE	61	22:30	27.2	35	4	ESE	13	1016.6	36.4	15	4	ESE	15	1012.5
24	We	22.1	39.4	0		12.2	ESE	65	00:19	27.4	34	0	E	35	1013.2	38.7	17		E	20	1009.2
25	Th	25.7	41.8	0		12.0	E	46	23:46	31.4	27	1	NE	13	1012.5	40.8	14	2	E	13	1008.5
26	Fr	26.4	39.9	0		7.3	E	63	09:07	31.4	31	1	E	35	1010.6	37.6	22		SSE	31	1008.8
27	Sa	22.4	38.7	0		11.5	E	70	01:17	27.4	42		E	37	1013.4	37.9	17		E	31	1011.6
28	Su	21.4	36.8	0		12.0	E	65	00:31	25.4	38		ENE	24	1016.6	36.2	14		ENE	22	1012.5

Statistics for February 2010

20 school days 16 days over 30° Monday 22 feb - fri 26 feb. Temps 34.8
37.2
39.4

Temperature, humidity, wind, pressure, cloud and rainfall observations are from Pearce RAAF {station 009053}. Sunshine observations are from Perth Airport {station 009021}.

The mean sea level pressure at Perth Airport is provided for convenience. On most occasions it will be within 1 hPa of that at Pearce.

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Feb * 19 out of 20 days in Feb over
(point at which learning is worse)

Pearce RAAF Base, Western Australia
March 2010 Daily Weather Observations

Most observations from Pearce RAAF Base, but some from Perth Airport.



Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am					3pm						
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours	km/h	local	°C	%	eighths	km/h	hPa	°C	%	eighths	km/h	hPa			
1	Mo	20.4	39.9	0		11.6	ENE	54	05:53	29.2	31		NE	26	1014.6	39.5	13	S	7	1010.9	
2	Tu	23.2	39.2	0		11.4	WNW	41	14:30	31.4	18	0	NNW	13	1013.4	36.2	20	3	W	19	1011.1
3	We	15.9	33.8	0		11.4	WSW	39	14:58	24.5	55	0	S	13	1014.0	32.1	35	0	WSW	30	1011.1
4	Th	16.6	28.9	0		11.3	WSW	46	16:12	20.2	52	4	SE	24	1017.7	27.1	38	1	WSW	28	1014.5
5	Fr	11.2	27.5	0		11.1	ESE	43	08:40	17.9	46	4	SE	28	1023.5	26.2	22	5	SE	24	1019.7
6	Sa	14.5	29.5	0		11.4	ESE	43	01:05	20.1	43		ESE	31	1024.5	28.2	27		SE	26	1020.7
7	Su	18.7	32.1	0		11.2	E	46	08:32	22.5	49		E	22	1021.4	31.1	23		E	17	1017.0
<i>Total 20 School days</i>																					
8	Mo	17.8	32.4	0		10.8	E	54	23:56	21.9	51	4	E	22	1020.6	31.2	24	2	E	19	1017.1
9	Tu	18.9	32.7	0		10.5	E	67	01:19	22.8	48	5	E	39	1020.7	32.2	23	4	E	20	1018.3
10	We	21.3	34.3	0		11.1	ENE	56	08:53	24.8	33	4	ENE	39	1021.1	34.0	17	5	NE	15	1017.6
11	Th	24.8	38.8	0		10.1	ENE	52	07:43	28.2	26	4	NE	22	1019.2	37.8	12	5	NW	15	1015.3
12	Fr	28.1	41.2	0		7.7				31.7	19	8	NNE	15	1017.5	39.0	12		NNW	17	1013.8
13	Sa	19.3	33.3	0		0.4	WSW	37	15:50				SW	4	1015.1	30.9	38		WSW	20	1014.4
14	Su	19.6	32.8	0		9.2	SW	37	14:45	25.8	58		SW	4	1015.1	30.6	46		WSW	22	1011.4
15	Mo	16.9	28.9	0		10.4	SW	43	15:39	23.4	73	5	SSW	11	1012.3	26.9	45	3	WSW	28	1010.6
16	Tu	15.4	27.1	0		10.4	WSW	46	15:16	20.6	47	2	SSE	26	1018.8	25.8	26	1	SSW	17	1016.9
17	We	14.4	29.8	0		11.1	E	41	02:21	19.5	41	0	E	20	1023.0	28.7	28	0	NE	11	1017.7
18	Th	11.8	31.3	0		9.2	SSW	37	15:06	20.4	47	3	SSW	7	1019.2	29.8	27	3	SSW	24	1016.3
19	Fr	11.3	25.8	0		1.0	WSW	31	14:27	20.1	56	7	SSW	9	1016.8	23.6	51	8	SW	20	1014.7
20	Sa	10.4	30.7	0		9.9	ESE	37	00:00	21.2	60		ESE	13	1016.8	29.1	27		SSE	15	1014.0
21	Su	19.0	33.9	0		8.1	NNW	56	22:06	24.0	56		E	24	1017.1	31.8	31		SE	26	1012.7
22	Mo	21.5	33.6	0		5.0				26.3	59		ENE	15	1015.0	32.0	34	8	E	6	1009.9
23	Tu	18.9	33.4	11.8		6.5	ENE	63	09:09	24.8	65	5	ENE	35	1012.6	31.0	50	6	W	26	1010.7
24	We	18.5	28.5	3.2		9.8	SW	39	15:18	22.1	82	4	S	11	1015.9	27.2	50	3	WSW	24	1014.2
25	Th	18.3	30.6	0		7.3				23.6	63	5	SSE	24		30.2	41	5	ESE	19	1013.4
26	Fr	18.8	29.9	0		6.0	E	56	01:39	21.7	64		E	24	1013.9	29.7	38		SE	13	1010.3
27	Sa	19.4	25.6	0		2.5	SSW	46	14:41	22.6	66		SSW	19	1011.1	23.3	58		SSW	31	1011.7
28	Su	14.7	26.7	0		11.0	S	46	14:26	19.4	51		SE	20	1020.6	25.9	27		SSE	19	1017.7
29	Mo	13.7	29.6	0		11.0	E	46	08:26	20.6	50	0	E	30	1021.5	29.3	23	0	E	19	1017.8
30	Tu	17.9	33.5	0		10.2	ENE	39	06:16	24.2	30	1	NNE	17	1016.4	32.7	14	2	WSW	28	1012.3
31	We	10.0	30.6	0		10.6	SE	54	23:28	19.5	64	2	S	15	1017.0	30.5	28	0	S	20	1013.2

Statistics for March 2010

Mean	17.5	31.8		9.0		23.2	50	3		20	1017.6	30.4	30	3		20	1014.4		
Lowest	10.0	25.6		0.4		17.9	18	0	SW	4	1011.1	23.3	12	0	E	6	1009.9		
Highest	28.1	41.2	11.8	11.6	E	67		31.7	82	8	#	39	1024.5	39.5	58	8	SSW	31	1020.7
Total			15.0		279.2														

Temperature, humidity, wind, pressure, cloud and rainfall observations are from Pearce RAAF (station 009053). Sunshine observations are from Perth Airport (station 009021)

The mean sea level pressure at Perth Airport is provided for convenience. On most occasions it will be within 1 hPa of that at Pearce.

19 of 20 school over 27°
13 days over 30°

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Pearce RAAF Base, Western Australia
April 2010 Daily Weather Observations

Most observations from Pearce RAAF Base, but some from Perth Airport.



Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm							
		Min	Max				Ddirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP		
		°C	°C	mm	mm	hours	km/h	local	°C	%	eighths	km/h	hPa	°C	%	eighths	km/h	hPa					
1	Th	17.3	30.7	0		10.9	ESE	46	08:39	21.7	52	1	ESE	20	1015.3	29.7	31		ESE	24	1010.5		
2	Fr	16.4	31.4	0		10.2	WNW	37	10:56	26.7	41		NNE	15	1007.9	27.6	45		WSW	20	1006.0		
3	Sa	17.8	23.6	0		8.9	WSW	48	14:28	18.9	62	8	S	31	1012.5	22.2	40		SW	26	1011.4		
4	Su	15.9	24.0	1.0		9.1	WSW	61	08:58	17.8	73	7	WSW	41	1012.1	22.6	46	3	WSW	28	1010.9		
5	Mo	9.1	24.2	0		5.6	SW	31	16:52	18.0	70	2	NNW	9	1012.3	23.4	46	7	WSW	13	1009.0		
6	Tu	15.6	26.8	0		5.5	WSW	35	15:45	18.1	74	8	SW	6	1007.5	25.5	37	6	WSW	17	1004.7		
7	We	10.8	30.7	0		9.8	SSW	37	15:00	19.8	58	0	NW	2	1013.1	29.7	29	3	S	22	1012.0		
8	Th	10.4	27.3	0		10.4	WSW	37	13:32	19.3	67	0	SW	4	1018.0	25.4	46	2	WSW	20	1016.0		
9	Fr	14.8	25.5	0		8.7	SSW	37	18:14	18.0	71	3	S	15	1018.7	24.6	42		SSW	22	1015.5		
10	Sa	14.2	25.1	0		10.2	SE	35	10:24	16.7	58	4	SSE	20	1022.1	24.2	31	1	SE	17	1018.3		
11	Su	15.6	31.6	0		9.9	ENE	46	07:45	20.0	42		ENE	17	1017.2	29.9	27	2	W	26	1010.8		
12	Mo	16.2	17.5	0		0.0	WSW	33	08:46	16.8	90	8	WSW	19	1009.1	16.0	81	8	W	11	1008.3		
13	Tu	11.0	24.5	1.2		4.4	N	52	12:44	17.5	68	5	NE	20	1009.6	23.5	39	7	N	31	1007.2		
14	We	14.9	25.3	6.4		8.5	NNW	59	11:05	19.8	67	1	N	31	1008.5	23.5	46	4	NW	41	1007.5		
15	Th	15.4	24.1	3.0		4.5	WSW	46	13:16	18.5	85	5	N	19	1013.0	23.4	55	7	W	26	1011.8		
16	Fr	15.3	25.3	2.6		10.3	WSW	35	14:27	19.0	81	2	NNW	11	1015.5	23.5	48	3	SW	19	1013.8		
17	Sa	9.7	27.5	0		8.8	E	39	07:52	19.4	61		E	20	1018.9	26.6	32		ESE	15	1015.2		
18	Su	17.6	33.2	0		10.5	WSW	50	15:17	22.1	45		NNE	9	1015.1	32.6	22		ESE	7	1010.7		
<i>TERM 2</i>		19	Mo	14.5	30.1	0		10.5	WSW	30	13:55	20.6	66	0	NNW	4	1011.3	27.7	37	0	WSW	20	1009.9
20	Tu	12.9	26.4	0		9.2	SW	30	13:03	18.2	94	8	S	11	1015.2	25.3	48	1	WSW	19	1012.4		
21	We	10.9	24.8	0		5.0	S	35	13:19	14.8	96	8		Calm	1017.3	24.3	48	2	SSW	20	1015.3		
22	Th	14.0	21.3	0		0.3	SW	28	14:45	17.1	74	7	S	15	1018.6	20.7	58	8	SSW	15	1017.0		
23	Fr	8.1	22.4	0		9.5	SSW	33	11:50	12.0	89	3	N	7	1022.6	21.7	39		SW	17	1019.7		
24	Sa	8.5	25.4	0		10.2	ESE	31	15:52	15.9	51		NE	13	1023.8	25.0	15		E	19	1019.8		
25	Su	8.4	28.2	0		10.4	ENE	33	08:17	20.4	31		NNE	6	1017.9	25.7	28		WSW	28	1015.9		
26	Mo	7.7	25.2	0		10.4	S	31	11:11	15.5	73		WNW	2	1025.9	24.8	32		S	7	1024.4		
27	Tu	8.1	26.8	0		10.1	E	33	06:17	17.7	53	0	ENE	22	1028.2	26.2	25	0	ESE	6	1023.4		
28	We	8.3	31.1	0		8.2	NNE	28	06:35	21.3	35	1	NE	15	1023.2	30.2	19	4	W	6	1019.2		
29	Th	10.4	32.4	0		8.2	NNW	33	12:45	25.2	24	2	NNE	15	1018.5	27.9	30	4	W	24	1016.0		
30	Fr	12.8		0		4.2				15.9	96	8	N	7	1022.3	22.8	56	5	WSW	22	1021.1		

Statistics for April 2010

Mean	12.8	26.6		8.1		18.8	64	3		14	1016.4	25.2	39	3		19	1013.8	
Lowest	7.7	17.5		0.0		12.0	24	0		Calm	1007.5	16.0	15	0	#	6	1004.7	
Highest	17.8	33.2	6.4	10.9	WSW	61	26.7	96	8	WSW	41	1028.2	32.6	81	8	NW	41	1024.4
Total			14.2		242.4													

Temperature, humidity, wind, pressure, cloud and rainfall observations are from Pearce RAAF (station 009053). Sunshine observations are from Perth Airport (station 009021)

The mean sea level pressure at Perth Airport is provided for convenience. On most occasions it will be within 1 hPa of that at Pearce

3 of 8 days over 27°

IDCJDW6108.201004 Prepared at 16:40 GMT on 2 Jun 2010
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<http://www.bom.gov.au/climate/dwo/IDCJDW000.pdf>

Mean Maximum Temperature (degrees Celsius)

PEARCE RAAF

Station Number: 009053 · State: WA · Opened: 1937 · Status: Open · Latitude: 31.67°S · Longitude: 116.02°E · Elevation: 40 m

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2006	30.3	33.1	31.7	24.1	23.0	20.3	18.7	20.2	20.5	25.0	29.1	32.7	25.7
2007	31.9	32.8	31.3	26.4	21.4	19.8	19.3	19.0	20.0	23.4	30.0	28.2	25.3
2008	35.2	33.0	31.0	24.5	22.8	19.5	17.4	18.8	20.6	24.6	24.4	29.9	25.1
2009	34.7	33.6	30.4	28.6	24.5	18.8	17.4	18.9	18.4	24.0	28.4	33.0	25.9
2010	36.0	34.3	31.8	26.6									

Quality control: 12.3 Done & acceptable, 12.3 Not completed or unknown



Mean Maximum Temperature (degrees Celsius)

UPPER SWAN RESEARCH STATION

Station Number: 009067 · State: WA · Opened: 1957 · Status: Closed 04 Nov 1998 · Latitude: 31.76°S · Longitude: 116.02°E · Elevation: 15 m

(15) Higher
than Pearce
Temps.
(19)

(16)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1965	34.7	34.3	30.6	27.1	22.0	18.6	17.3	17.2	19.7	22.9	24.7	31.2	25.0
1966	33.7	32.3	31.9	23.5	22.6	17.9	17.7	18.0	18.8	24.3	27.2	31.9	25.0
1967	33.6	33.7	30.3	25.8	20.5	19.3	17.7	17.1	23.0	25.3	26.5	30.3	25.3
1968	34.7	31.5	26.0	21.3	19.9	16.8	17.8	16.7	18.1	21.6	24.8	31.4	23.4
1969	30.3	33.2	29.5	25.5	22.1	19.7	18.8	18.6	20.8	28.0	31.1	30.4	25.7
1970	31.0	34.1	31.6	25.3	21.9	18.4	19.3	19.0	19.8	24.4	27.3	33.3	25.4
1971	31.9	32.5	29.8	24.4	22.0	19.8	18.3	17.7	19.0	20.8	22.7	29.9	24.1
1972	33.6	35.9	31.6	26.8	24.8	19.4	17.4	17.7	20.7	24.4	29.0	32.9	26.2
1973	34.0	31.9	31.3	25.9	21.3	17.5	18.1	17.9	19.2	22.6	27.3	30.5	24.8
1974	36.2	32.8	32.2	23.9	20.9	18.7	17.2	18.2	22.2	22.2	26.4	32.8	25.3
1975	32.6	35.6	30.1	25.8	22.0	19.6	18.0	18.6	20.7	22.6	27.2	32.4	25.4
1976	31.4	36.0	33.2	28.5	23.7	20.0	20.1	19.7	21.7	25.2	25.1	29.4	26.2
1977	33.9	36.1	31.2	28.4	21.2	20.9	19.6	18.9	21.0	23.9	28.6	33.9	26.5
1978	36.4	34.7	32.7	29.2	22.6	18.1	17.1	20.1	19.8	25.1	30.7	32.2	26.6
1979	32.6	33.0	30.5	25.1	21.6	20.0	18.4	18.0	19.4	24.7	27.5	30.6	25.1
1980	36.3	32.9	33.6	24.5	22.6	18.4	18.5	19.1	20.2	22.0	25.9	30.4	25.4
1981	35.0	30.8	31.8	28.3	23.0	16.9	17.3	17.8	21.4	23.7	25.3	29.7	25.1
1982	30.7	35.5	30.1	27.5	21.9	18.4	18.2	19.7	20.5	24.7	30.4	30.2	25.6
1983	35.1	30.7	33.1	26.8	24.6	21.6	18.6	20.2	21.4	24.9	26.4	30.8	26.2
1984	34.3	34.3	29.0	28.3	20.7								
1985	33.2	39.5	34.0	26.2	23.4	20.9	18.4	17.9					
1986	34.5	31.1	28.9	26.1	20.0	18.3	15.8	17.5	20.1	21.2	27.3	29.8	24.2
1987							18.4	19.5					
1989	34.6	34.3	32.0	28.7	19.8	18.6	17.3	20.2	20.9	20.9	29.0	31.7	25.7
1990	31.8	33.3	29.6	27.1	22.9	18.3	17.4	16.9	23.1	24.4	26.6	30.4	25.1
1991	34.3	34.3	32.5	29.6									

based on readings from the Upper Swan Research Station (1965-1991) temps. are higher than those recorded at Pearce

Quality control: 12.3 Done & acceptable, 12.3 Not completed or unknown



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Australian Climate Extremes - Time series

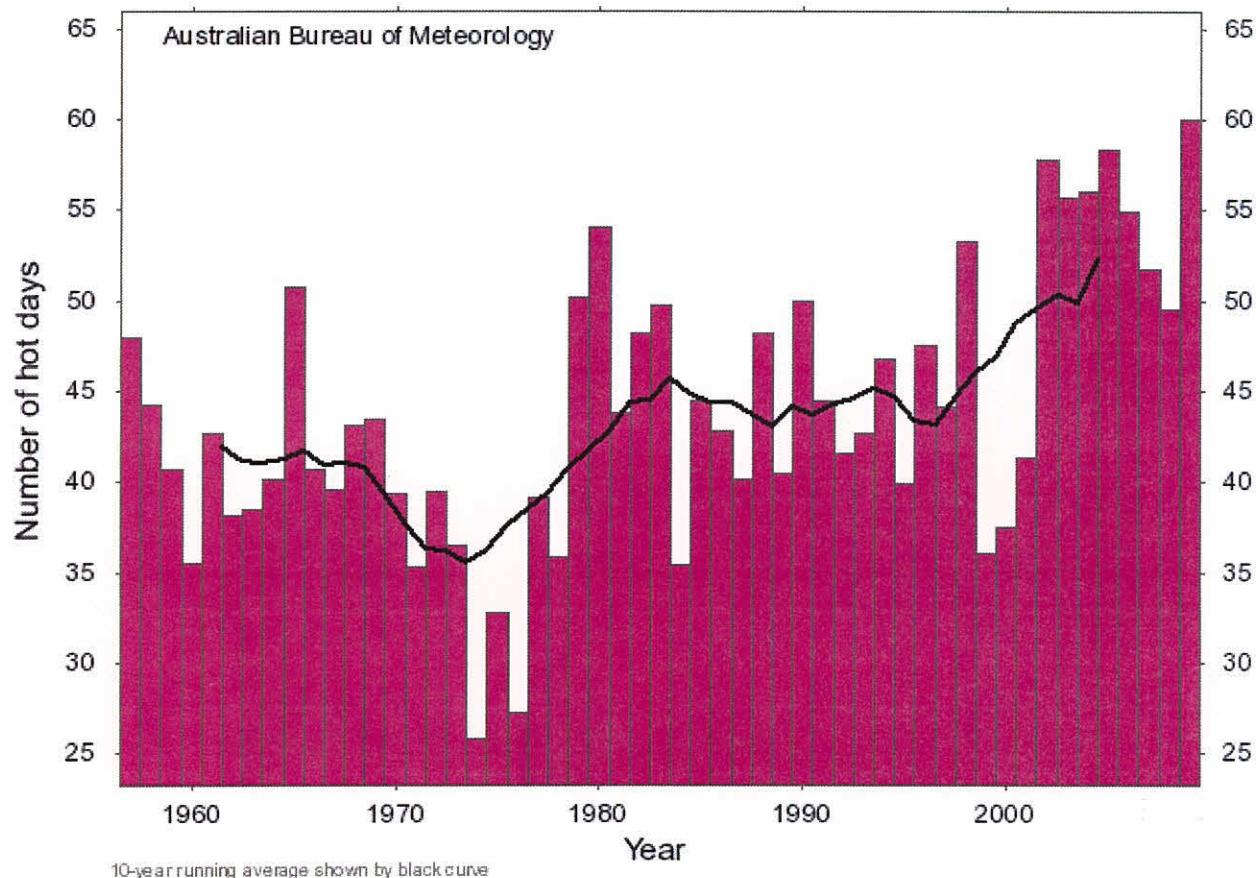
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Average number of hot days



10-year running average shown by black curve

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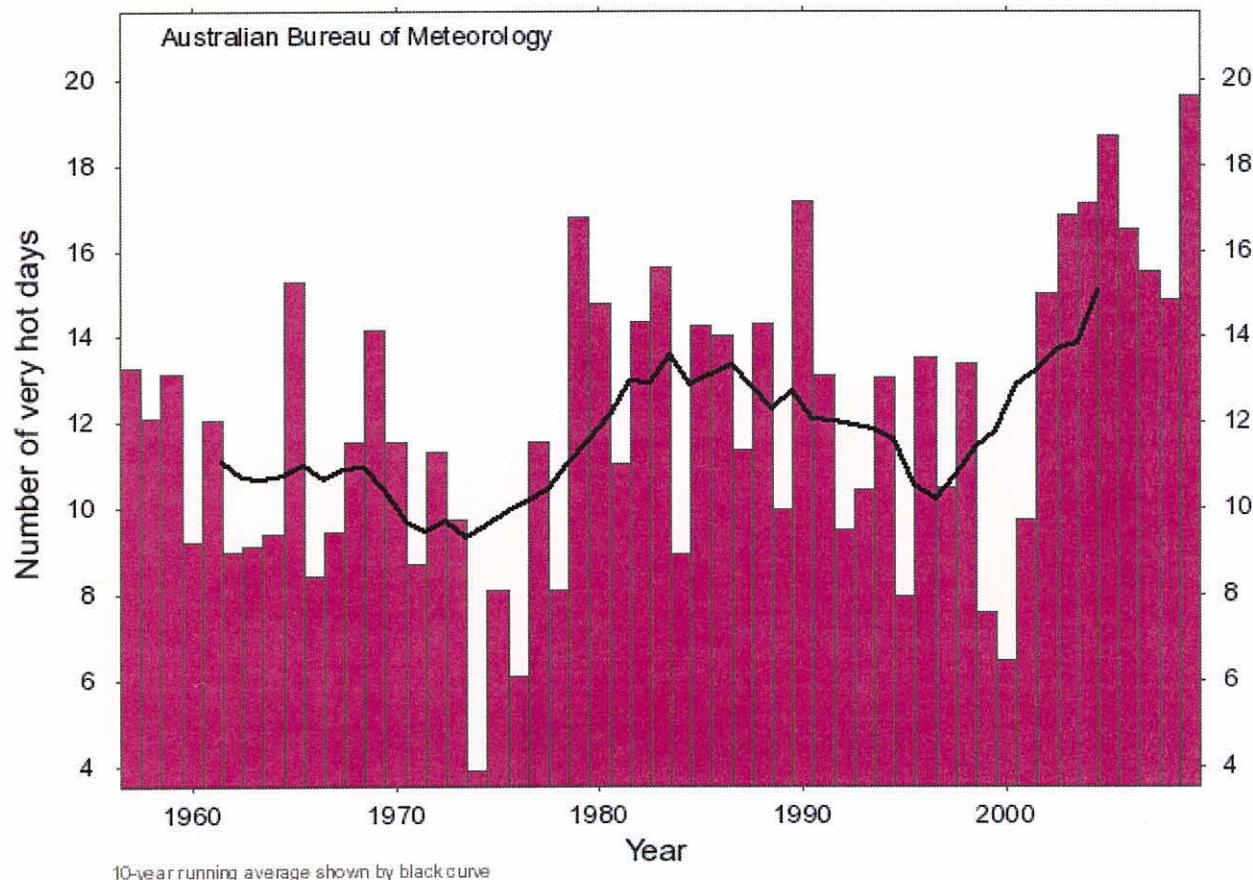
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