

# **WATER USE ON AUSTRALIAN FARMS**

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For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070.

# NOTES

## BACKGROUND

This publication presents estimates of agricultural water use, including pastures and crops irrigated. Estimates are presented for Australia, state/territories and Natural Resource Management (NRM) regions, as well as for the Murray–Darling Basin. The estimates are compiled from data collected as part of the Agricultural Resource Management Survey (ARMS) for the year ended 30 June 2008.

Climatic conditions affect both the availability of water for irrigation and the need to irrigate in order to supplement rainfall. Information from the Bureau of Meteorology outlining climatic conditions over the period July 2007 to June 2008 are presented as an appendix to assist in interpreting these data.

## CHANGES IN THIS ISSUE

A reduced range of commodity items was collected from the 2007–08 ARMS in comparison to surveys and censuses of previous years. In addition, some irrigation crop categories have been altered. More information is available upon request.



## ABBREVIATIONS

ACT	Australian Capital Territory
Aust.	Australia
EVAO	Estimated Value of Agricultural Operations
ha	hectare
MDB	Murray-Darling Basin
ML	megalitre
ML/ha	megalitres per hectare
no.	number
NRM	natural resource management
NSW	New South Wales
NT	Northern Territory
Qld	Queensland
RSE	relative standard error
SA	South Australia
SE	standard error
Tas.	Tasmania
Vic.	Victoria
WA	Western Australia
°C	degrees Celsius

Brian Pink  
Australian Statistician

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# CHAPTER 1

## SUMMARY OF AGRICULTURAL WATER USE .....

### AGRICULTURAL WATER USE

The agriculture industry remained a major consumer of water in the Australian economy in 2007–08. The volume of water used for irrigation and application rates declined further in 2007–08 due to the continuing unavailability of water following the drought.

Australia's agricultural water use in 2007–08 decreased 18% to 6,989 gigalitres on the back of a 27% drop in 2006–07.

In both years, the decrease was substantially driven by decreases in New South Wales where water use decreased by 41% in 2006–07 and by 35% in 2007–08. Since 2005–06, New South Wales' agricultural water use has declined 2,939 gigalitres.

### **1.1** AGRICULTURAL WATER USE, by State—2007–08

	WATER USE			
	<i>Agricultural businesses</i>	<i>Irrigation</i>	<i>Other agriculture uses</i>	<i>Total water use</i>
	no.	ML	ML	ML
New South Wales(a)	44 521	1 677 083	178 691	1 855 774
Victoria	34 177	1 332 045	138 822	1 470 867
Queensland	29 121	1 842 729	196 442	2 039 170
South Australia	14 996	880 268	53 685	933 953
Western Australia	13 084	284 878	85 026	369 904
Tasmania	4 200	252 113	18 795	270 908
Northern Territory	605	^ 15 683	^ 32 994	^ 48 677
<b>Australia</b>	<b>140 704</b>	<b>6 284 799</b>	<b>704 455</b>	<b>6 989 254</b>

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(a) Includes ACT.

### IRRIGATION WATER USE

In 2007–08, the amount of irrigation water used by Australia's 40 thousand irrigating agricultural businesses decreased 18% to 6,285 gigalitres. Of the 1,351 gigalitre decrease, New South Wales contributed 928 gigalitres, over two thirds of the decrease.

All states/territories reported decreased irrigation water use except Queensland, which remained steady. As a result, Queensland became the largest irrigating state, using 1,843 gigalitres for irrigation in 2007–08.

There were 2 thousand less irrigating agricultural businesses in Australia in 2007–08 than in 2006–07. Nationally, 72 thousand hectares less land was irrigated at a decreased application rate of 3.4 ML/ha.

**1.2** IRRIGATION ACTIVITY, by State—2003–04 to 2007–08

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area of agricultural holding</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(a)</b>						
2003–04	130 526	40 400	440 109 578	2 402 137	10 441 515	4.3
2004–05	129 934	35 244	445 148 804	2 404 864	10 084 596	4.2
<b>New basis(b)</b>						
2005–06	154 681	44 826	434 924 814	2 546 318	10 737 364	4.2
2006–07	150 817	41 787	425 449 341	1 922 982	7 636 194	4.0
2007–08(c)	140 704	39 637	417 287 562	1 850 937	6 284 799	3.4
<b>2007–08</b>						
<b>New basis(b)</b>						
New South Wales(d)	44 521	8 974	58 154 425	525 021	1 677 083	3.2
Victoria	34 177	10 309	12 535 698	427 584	1 332 045	3.1
Queensland	29 121	9 047	141 057 855	512 774	1 842 729	3.6
South Australia	14 996	6 114	47 075 615	225 716	880 268	3.9
Western Australia	13 084	2 720	93 034 706	63 364	284 878	4.5
Tasmania	4 200	2 185	1 541 487	91 538	252 113	2.8
Northern Territory	605	288	^ 63 887 775	^ 4 940	^ 15 683	^ 3.2

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

(a) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(b) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(c) Totals include other pastures or crops not elsewhere classified.

(d) Includes ACT.

IRRIGATION WATER USE  
*continued*

Victoria had the greatest number of irrigating agricultural businesses of the states/territories and accounted for 26% of Australia's irrigating businesses. Tasmania had the highest proportion of irrigators (52%) and irrigated agricultural land (6%) in 2007–08.

The area of irrigated agricultural land increased in most states/territories with exception of New South Wales, Victoria and the Northern Territory. These states/territories also recorded the largest drops in the volume of irrigation water applied from 2006–07 to 2007–08 (36%, 19% and 21% respectively).

Of Australia's irrigated agricultural land, 34% (624 thousand hectares) was irrigated by agricultural businesses with an area of holding of 100<500 hectares, and only 3% (54 thousand hectares) by businesses with up to 15 hectares. Only 92 businesses with 25 thousand hectares or more, irrigated their land, and of this, less than 1% of the area of holding was irrigated.

**1.3** IRRIGATION ACTIVITY, Australia—by Area of holding—2007–08

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area of agricultural holding</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>Area of holding (ha)</b>						
Total	140 704	39 637	417 287 562	1 850 937	6 284 799	3.4
<15	14 689	9 293	96 293	53 880	191 206	3.5
15<50	20 665	7 987	647 193	106 562	388 867	3.6
50<100	17 118	5 518	1 224 722	139 691	449 582	3.2
100<500	43 117	11 135	10 516 260	623 840	2 071 248	3.3
500<1,000	15 445	2 628	10 867 143	269 329	865 735	3.2
1,000<2,500	15 836	1 781	24 459 540	261 922	877 822	3.4
2,500<25,000	11 749	1 202	78 792 106	340 742	1 192 575	3.5
25,000>	2 085	^ 92	290 684 306	54 970	247 763	4.5

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

IRRIGATION WATER USE  
*continued*

The Murray–Darling Basin accounted for 39% of Australia's irrigating agricultural businesses, 52% of all irrigated agricultural land and 50% of irrigation water applied in 2007–08.

The Queensland MDB region was the only MDB region to increase its volume of irrigation water applied in 2007–08 (up 34%). The region also irrigated 61% more agricultural land than in 2006–07, irrigating only 7% less land than in 2005–06.

**1.4** IRRIGATION ACTIVITY, Murray–Darling Basin(a)—2007–08

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area of agricultural holding</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
MDB in NSW	27 438	4 808	53 662 089	449 690	1 483 874	3.3
MDB in Vic.	17 408	6 846	8 336 251	298 578	937 927	3.1
MDB in Qld	7 472	1 506	29 198 463	136 656	405 615	3.0
MDB in SA	4 269	2 320	4 364 951	72 828	314 243	4.3
<b>MDB</b>	<b>56 586</b>	<b>15 479</b>	<b>95 561 754</b>	<b>957 752</b>	<b>3 141 659</b>	<b>3.3</b>
non MDB	84 118	24 158	321 725 808	893 185	3 143 140	3.5
<b>Australia</b>	<b>140 704</b>	<b>39 637</b>	<b>417 287 562</b>	<b>1 850 937</b>	<b>6 284 799</b>	<b>3.4</b>

(a) Based on NRM regions. Refer to Explanatory Notes paragraph 14.

PASTURES AND CROPS  
IRRIGATED  
*Australia*

Australian irrigating agricultural businesses applied 18% less irrigation water to agricultural land in 2007–08 than the previous year. The area irrigated nationally decreased 4% to 1,851 thousand hectares.

The rice industry showed the effects of dry conditions and limited irrigation water with only 23 rice producers using 27 gigalitres of irrigation water, a drop of 89%. This drop in application of irrigation water follows the 81% reduction in 2006–07.

Cotton growers faced similar conditions in 2007–08 and applied 309 gigalitres of irrigation water to 58 thousand hectares. This was in comparison to the 868 gigalitres used for irrigation and 134 thousand hectares irrigated in 2006–07.

*State/Territory*

While in 2006–07 cotton growers were the primary users of irrigation water in New South Wales, accounting for 26% of irrigation water use, in 2007–08 the major irrigators were irrigating other cereals for grain or seed, using 34% of all irrigation water applied. The area of cotton crop irrigated in New South Wales fell 62 thousand hectares (63%).

The volume of water applied to grapevines nationally dropped from 639 gigalitres in 2006–07 to 517 gigalitres in 2007–08. Victoria accounted for over half of this reduction, with water used on grapevines declining to 153 gigalitres. Pasture, cereal and other crops for grazing used the majority of Victoria's irrigation water (50%), irrigating 221 thousand hectares at an application rate of 3.0ML/ha.

Whilst reporting a downturn in area under crop, sugar cane producers continued to be the largest irrigator in Queensland, using 45% of the state's irrigation water at an application rate of 4.5ML/ha. Queensland saw a large increase in irrigation of other cereals for grain or seed (327 gigalitres).

In 2007–08, pasture, cereal and other crops used for grazing was the major use of irrigation water in South Australia, Western Australia and Tasmania, accounting for 32%, 35% and 62% of irrigation water applied in each state respectively.

Grapevines were the second largest irrigation water consumers in South Australia (23%) in 2007–08. The second largest irrigators in Western Australia were fruit tree, nut tree, plantation or berry fruit producers, irrigating 67% of the area of these crops, at an application rate of 4.7ML/ha. In Tasmania, 44 gigalitres of water was applied to vegetables for human consumption or seed, the second largest irrigated agricultural area in the state at 14 thousand hectares.

Irrigation of fruit trees, nut trees, plantation fruit or berries in the Northern Territory continued to decline from 13 gigalitres in 2006–07, to 7 gigalitres in 2007–08.

*Murray–Darling Basin*

The area of agricultural land irrigated in the Murray–Darling Basin continued to decrease in 2007–08, to 958 thousand hectares, with 30% less irrigation water being applied than in 2006–07. These drops follow the declines of 2006–07 where the area irrigated fell 33%, and the volume of irrigation water applied fell 40%.

In contrast, irrigation water use outside the Murray–Darling Basin decreased much less in both years, down 1% between 2006–07 and 2007–08, following on from a decline of 6% between 2005–06 and 2006–07.

All of Australia's rice producers were located in the Murray–Darling Basin in 2007–08, and the impact of limited irrigation water was seen at the national level. Similarly, 92% of Australia's cotton growers are located in the region, irrigating 81 thousand hectares (60%) less land than in 2006–07.

In 2007–08, other cereals for grain or seed accounted for the highest proportion of irrigation water in the region (26%) followed by pasture, cereal and other crops for grazing (21%) and grapevines (14%).



## 2.1 PASTURES AND CROPS IRRIGATED(a), Australia—2003–04 to 2007–08 .....

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(b)</b>						
2003–04	130 526	40 400	440 109 578	2 402 137	10 441 515	4.3
2004–05	129 934	35 244	445 148 804	2 404 864	10 084 596	4.2
<b>New basis(c)</b>						
2005–06	154 681	44 826	434 924 814	2 546 318	10 737 364	4.2
2006–07	150 817	41 787	425 449 341	1 922 982	7 636 194	4.0
2007–08(d)	(e)140 704	(e)39 637	(f)417 287 562	1 850 937	6 284 799	3.4
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	82 869	12 319	66 667 275	544 130	1 641 464	3.0
Pasture, cereal and other crops cut for hay(g)	44 606	5 487	2 677 255	146 540	501 588	3.4
Pasture, cereal and other crops cut for silage(g)	na	2 109	na	^ 64 778	^ 162 060	2.5
Rice	^ 23	^ 23	2 072	2 072	26 664	12.9
Other cereals for grain or seed(h)	36 500	2 000	19 659 521	339 626	954 958	2.8
Cotton	346	309	68 540	57 958	309 442	5.3
Sugar cane	4 263	1 827	380 543	187 177	863 198	4.6
Other broadacre crops(i)	20 296	888	3 772 608	57 721	185 394	3.2
Fruit trees, nut trees, plantation or berry fruits(j)	12 025	7 043	187 499	130 721	559 924	4.3
Vegetables for human consumption or seed	5 970	5 288	122 806	113 753	430 649	3.8
Nurseries, cut flowers and cultivated turf	2 870	2 598	17 208	14 224	62 257	4.4
Grapevines	7 769	7 327	175 186	167 525	516 790	3.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

na not available

(a) Refer to Explanatory Notes paragraph 12.

(b) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.

(g) Including lucerne.

(h) Excludes rice.

(i) Excludes cereals, sugar cane and cotton.

(j) Excludes grapevines.

## 2.2 PASTURES AND CROPS IRRIGATED(a), New South Wales(b)—2003–04 to 2007–08

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(c)</b>						
2003–04	40 915	9 998	63 630 558	892 352	3 953 125	4.4
2004–05	40 162	8 606	64 403 733	910 124	3 716 557	4.1
<b>New basis(d)</b>						
2005–06	48 937	11 604	62 164 155	994 199	4 534 109	4.6
2006–07	47 869	10 689	58 660 611	680 011	2 605 019	3.8
2007–08(e)	(f)44 521	(f)8 974	(g)58 154 425	525 021	1 677 083	3.2
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(h)	26 960	2 426	15 081 559	125 621	^ 291 572	2.3
Pasture, cereal and other crops cut for hay(h)	10 881	1 412	858 707	^ 43 896	^ 156 508	3.6
Pasture, cereal and other crops cut for silage(h)	na	^ 499	na	^ 15 784	^ 41 621	2.6
Rice	^ 23	^ 23	2 072	2 072	26 664	12.9
Other cereals for grain or seed(i)	12 156	932	5 801 573	200 467	571 730	2.9
Cotton	178	169	39 792	36 728	204 646	5.6
Sugar cane	537	*21	*23 790	*914	*3 569	*3.9
Other broadacre crops(j)	5 360	^ 154	843 064	15 545	^ 36 704	2.4
Fruit trees, nut trees, plantation or berry fruits(k)	3 613	1 614	51 726	29 559	135 259	4.6
Vegetables for human consumption or seed	1 436	1 240	15 481	12 273	48 081	3.9
Nurseries, cut flowers and cultivated turf	919	861	3 926	^ 3 158	^ 16 270	5.2
Grapevines	1 418	1 329	37 829	35 797	135 294	3.8

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

na not available

(a) Refer to Explanatory Notes paragraph 12.

(b) Includes ACT.

(c) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(d) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(e) Totals include other pastures or crops not elsewhere classified.

(f) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(g) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.

(h) Including lucerne.

(i) Excludes rice.

(j) Excludes cereals, sugar cane and cotton.

(k) Excludes grapevines.

## 2.3 PASTURES AND CROPS IRRIGATED(a), Victoria—2003–04 to 2007–08 .....

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(b)</b>						
2003–04	32 463	10 844	13 618 567	618 582	2 559 385	4.1
2004–05	32 357	9 829	13 919 989	635 538	2 363 764	3.7
<b>New basis(c)</b>						
2005–06	37 146	11 621	12 313 994	647 729	2 448 485	3.8
2006–07	37 429	10 557	13 250 203	437 654	1 648 914	3.8
2007–08(d)	(e)34 177	(e)10 309	(f)12 535 698	427 584	1 332 045	3.1
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	23 985	4 668	5 337 722	220 609	662 099	3.0
Pasture, cereal and other crops cut for hay(g)	16 574	^ 1 487	942 027	^ 44 590	^ 128 870	^ 2.9
Pasture, cereal and other crops cut for silage(g)	na	^ 927	na	^ 31 596	^ 66 588	2.1
Other cereals for grain or seed(h)	7 899	^ 302	2 831 569	^ 15 476	^ 29 443	^ 1.9
Other broadacre crops(i)	4 351	*109	707 413	*6 980	*21 407	3.1
Fruit trees, nut trees, plantation or berry fruits(j)	2 036	1 311	42 960	33 464	162 430	4.9
Vegetables for human consumption or seed	1 037	868	30 687	27 661	85 970	3.1
Nurseries, cut flowers and cultivated turf	613	554	^ 5 242	^ 3 943	^ 13 289	3.4
Grapevines	2 236	2 132	^ 41 263	^ 39 232	^ 152 661	3.9

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

na not available

(a) Refer to Explanatory Notes paragraph 12.

(b) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.

(g) Including lucerne.

(h) Excludes rice.

(i) Excludes cereals, sugar cane and cotton.

(j) Excludes grapevines.

## 2.4 PASTURES AND CROPS IRRIGATED(a), Queensland—2003–04 to 2007–08 .....

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(b)</b>						
2003–04	26 785	9 520	144 287 672	561 364	2 420 048	4.3
2004–05	27 132	8 258	143 796 674	541 869	2 613 404	4.8
<b>New basis(c)</b>						
2005–06	32 212	9 861	145 519 376	539 157	2 325 003	4.3
2006–07	30 650	8 757	143 870 532	457 822	1 840 252	4.0
2007–08(d)	(e)29 121	(e)9 047	(f)141 057 855	512 774	1 842 729	3.6
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	13 474	2 354	32 674 577	^ 62 940	153 100	^ 2.4
Pasture, cereal and other crops cut for hay(g)	4 086	1 454	149 325	27 384	79 542	2.9
Pasture, cereal and other crops cut for silage(g)	na	^ 394	na	^ 10 626	^ 40 218	3.8
Other cereals for grain or seed(h)	3 902	579	1 463 344	106 325	327 456	3.1
Cotton	168	140	28 748	21 230	104 796	4.9
Sugar cane	3 716	1 797	354 515	184 025	834 414	4.5
Other broadacre crops(i)	2 379	*190	245 799	*17 028	*44 434	2.6
Fruit trees, nut trees, plantation or berry fruits(j)	2 724	1 719	49 253	35 426	106 655	3.0
Vegetables for human consumption or seed	1 629	1 462	35 190	33 650	^ 112 980	3.4
Nurseries, cut flowers and cultivated turf	665	591	^ 4 853	^ 4 383	16 110	^ 3.7
Grapevines	^ 120	^ 92	^ 1 359	^ 1 267	^ 4 700	^ 3.7

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

na not available

(a) Refer to Explanatory Notes paragraph 12.

(b) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.

(g) Including lucerne.

(h) Excludes rice.

(i) Excludes cereals, sugar cane and cotton.

(j) Excludes grapevines.

## 2.5 PASTURES AND CROPS IRRIGATED(a), South Australia—2003–04 to 2007–08 ..

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(b)</b>						
2003–04	14 238	5 494	52 519 620	185 419	957 163	5.2
2004–05	14 111	4 739	54 107 074	183 589	877 818	4.8
<b>New basis(c)</b>						
2005–06	16 455	6 298	55 408 492	216 749	897 197	4.1
2006–07	15 835	6 447	50 064 634	200 594	966 057	4.8
2007–08(d)	(e)14 996	(e)6 114	(f)47 075 615	225 716	880 268	3.9
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	7 029	1 316	4 299 854	^ 69 603	278 413	4.0
Pasture, cereal and other crops cut for hay(g)	5 029	^ 586	322 339	^ 22 401	^ 117 723	5.3
Pasture, cereal and other crops cut for silage(g)	na	^ 114	na	^ 3 867	^ 9 063	^ 2.3
Other cereals for grain or seed(h)	6 276	^ 57	3 506 746	^ 7 599	^ 9 073	^ 1.2
Other broadacre crops(i)	3 841	^ 126	636 122	^ 7 713	^ 52 980	6.9
Fruit trees, nut trees, plantation or berry fruits(j)	1 636	1 098	21 361	16 448	94 390	5.7
Vegetables for human consumption or seed	^ 607	562	15 619	15 502	88 244	5.7
Nurseries, cut flowers and cultivated turf	^ 218	^ 188	860	761	2 450	3.2
Grapevines	2 928	2 803	79 545	77 165	^ 203 349	2.6

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

na not available

(a) Refer to Explanatory Notes paragraph 12.

(b) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.

(g) Including lucerne.

(h) Excludes rice.

(i) Excludes cereals, sugar cane and cotton.

(j) Excludes grapevines.

## 2.6 PASTURES AND CROPS IRRIGATED(a), Western Australia—2003–04 to 2007–08

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(b)</b>						
2003–04	11 876	2 459	101 184 221	54 014	308 254	5.7
2004–05	11 915	2 049	104 645 889	44 638	267 098	6.0
<b>New basis(c)</b>						
2005–06	14 526	3 173	98 652 515	60 336	306 284	5.1
2006–07	13 608	2 935	96 741 958	53 268	293 186	5.5
2007–08(d)	(e)13 084	(e)2 720	(f)93 034 706	63 364	284 878	4.5
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	7 900	^ 417	^ 6 395 299	^ 16 566	^ 98 698	6.0
Pasture, cereal and other crops cut for hay(g)	5 413	^ 42	330 558	np	np	np
Pasture, cereal and other crops cut for silage(g)	na	*11	na	*269	np	np
Other cereals for grain or seed(h)	5 754	*12	6 036 676	*4 956	9 902	**2.0
Sugar cane	10	10	2 238	2 238	25 214	11.3
Other broadacre crops(i)	3 828	^ 13	1 317 343	np	^ 15 218	np
Fruit trees, nut trees, plantation or berry fruits(j)	1 387	876	^ 15 216	10 171	48 062	4.7
Vegetables for human consumption or seed	^ 574	501	10 391	9 436	47 527	5.0
Nurseries, cut flowers and cultivated turf	^ 308	^ 264	1 812	np	12 541	np
Grapevines	891	822	^ 13 510	^ 12 691	^ 17 239	^ 1.4

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

\* estimate has a relative standard error of 25% to 50% and should be used with caution

\*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use

na not available

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Refer to Explanatory Notes paragraph 12.

(b) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.

(g) Including lucerne.

(h) Excludes rice.

(i) Excludes cereals, sugar cane and cotton.

(j) Excludes grapevines.

**2.7****PASTURES AND CROPS IRRIGATED(a), Tasmania—2003–04 to 2007–08** .....

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(b)</b>						
2003–04	3 866	1 939	1 744 791	86 628	229 355	2.6
2004–05	3 877	1 654	1 802 702	85 545	231 758	2.7
<b>New basis(c)</b>						
2005–06	4 745	1 919	1 739 161	80 912	203 931	2.5
2006–07	4 783	2 060	1 659 163	87 472	263 029	3.0
2007–08(d)	(e) 4 200	(e) 2 185	(f) 1 541 487	91 538	252 113	2.8
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	3 391	1 123	775 119	48 538	^ 157 182	3.2
Pasture, cereal and other crops cut for hay(g)	2 528	^ 500	63 822	^ 7 168	^ 12 634	1.8
Pasture, cereal and other crops cut for silage(g)	na	^ 164	na	^ 2 635	np	np
Other cereals for grain or seed(h)	503	^ 117	19 133	^ 4 804	^ 7 354	1.5
Other broadacre crops(i)	482	^ 292	14 041	7 071	np	np
Fruit trees, nut trees, plantation or berry fruits(j)	380	^ 235	3 360	2 571	6 218	2.4
Vegetables for human consumption or seed	612	569	14 500	14 224	43 816	3.1
Nurseries, cut flowers and cultivated turf	^ 113	^ 106	416	313	np	np
Grapevines	^ 168	^ 141	1 287	1 061	^ 1 356	1.3

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

na not available

np not available for publication but included in totals where applicable, unless otherwise indicated

(a) Refer to Explanatory Notes paragraph 12.

(b) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.

(c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.

(g) Including lucerne.

(h) Excludes rice.

(i) Excludes cereals, sugar cane and cotton.

(j) Excludes grapevines.

## 2.8 PASTURES AND CROPS IRRIGATED(a), Northern Territory—2003–04 to 2007–08

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>Old basis(b)</b>						
2003–04	382	145	63 124 149	3 777	14 186	3.8
2004–05	380	110	62 472 742	3 562	14 198	4.0
<b>New basis(c)</b>						
2005–06	659	351	59 127 121	7 235	22 356	3.1
2006–07	643	342	61 202 240	6 161	19 737	3.2
2007–08(d)	(e)605	(e)288	^(f)63 887 775	^4 940	^15 683	^3.2

### 2007–08

<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	^130	^15	^2 103 145	^253	^400	^1.6
Pasture, cereal and other crops cut for hay(g)	^95	^6	^10 476	np	np	np
Other cereals for grain or seed(h)	**10	—	**480	—	—	—
Other broadacre crops(i)	*54	*4	*8 826	np	np	np
Fruit trees, nut trees, plantation or berry fruits(j)	247	^190	^3 624	^3 083	^6 910	^2.2
Vegetables for human consumption or seed	^74	^88	^937	^1 006	^4 031	^4.0
Nurseries, cut flowers and cultivated turf	^33	^33	99	np	np	np
Grapevines	**9	**9	**395	**312	**2 191	7.0

- ^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
- \* estimate has a relative standard error of 25% to 50% and should be used with caution
- \*\* estimate has a relative standard error greater than 50% and is considered too unreliable for general use
- nil or rounded to zero (including null cells)
- np not available for publication but included in totals where applicable, unless otherwise indicated
- (a) Refer to Explanatory Notes paragraph 12.
- (b) Derived using ABS-maintained frame. Refer to Explanatory Notes paragraph 9.
- (c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.
- (d) Totals include other pastures or crops not elsewhere classified.
- (e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.
- (f) Total includes area of agricultural land. This does not equal the sum or area under pasture or crop as not all land on agricultural holdings is under pasture or crops.
- (g) Including lucerne.
- (h) Excludes rice.
- (i) Excludes cereals, sugar cane and cotton.
- (j) Excludes grapevines.



## 2.9 PASTURES AND CROPS IRRIGATED (a), Murray–Darling Basin(b)—2005–06 to 2007–08

	<i>Agricultural businesses</i>	<i>Agricultural businesses irrigating</i>	<i>Area under pasture or crop</i>	<i>Area irrigated</i>	<i>Volume applied</i>	<i>Application rate</i>
	no.	no.	ha	ha	ML	ML/ha
<b>TOTAL</b>						
<b>New basis(c)</b>						
2005–06	61 033	18 634	88 827 650	1 653 788	7 369 807	4.5
2006–07	59 685	17 062	97 160 318	1 101 410	4 458 279	4.1
2007–08(d)	(e)56 586	(e)15 479	(f)95 561 754	957 752	3 141 659	3.3
<b>2007–08</b>						
<b>New basis(c)</b>						
Pasture, cereal and other crops used for grazing(g)	33 349	5 277	24 981 004	250 760	656 771	2.6
Pasture, cereal and other crops cut for hay(g)	18 654	2 658	1 519 061	79 588	^261 148	3.3
Pasture, cereal and other crops cut for silage(g)	na	^929	na	^34 170	^79 464	2.3
Rice	^23	^23	2 072	2 072	26 664	12.9
Other cereals for grain or seed(h)	21 870	1 566	10 109 919	290 878	805 267	2.8
Cotton	318	283	63 438	53 108	^282 568	5.3
Other broadacre crops(i)	9 585	^337	1 653 667	^32 811	85 329	2.6
Fruit trees, nut trees, plantation or berry fruits(j)	4 026	2 843	88 768	70 593	356 082	5.0
Vegetables for human consumption or seed	1 073	792	32 408	27 910	124 017	4.4
Nurseries, cut flowers and cultivated turf	^343	^270	^3 340	^2 466	^9 376	3.8
Grapevines	4 264	4 077	109 170	105 575	433 862	4.1

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution

na not available

(a) Refer to Explanatory Notes paragraph 12.

(b) Based on NRM regions. Refer to Explanatory Notes paragraph 14.

(c) Derived using ABSBR. Refer to Explanatory Notes paragraph 9.

(d) Totals include other pastures or crops not elsewhere classified.

(e) Total does not equal the sum as many establishments grow or irrigate more than one crop or pasture.

(f) Total includes area of all agricultural land. This does not equal the sum of area under pasture or crop as not all land on agricultural holdings is under pasture or crop.

(g) Includes lucerne.

(h) Excludes rice.

(i) Excludes cereals, sugar cane and cotton.

(j) Excludes grapevines.

## EXPLANATORY NOTES .....

### INTRODUCTION

**1** Changes to the Australian Bureau of Statistics (ABS) Agricultural survey program for 2007–08 resulted in the annual Agricultural Survey being combined with a benchmark survey of land management practices by agricultural businesses, and a survey of management responses to adverse seasonal conditions experienced by affected agricultural businesses. The combined survey is the Agricultural Resource Management Survey (ARMS).

**2** This publication presents estimates of water use from the 2007–08 ARMS. It contains detailed statistics at the national and state/territory levels, as well as for the Murray-Darling Basin, on agricultural water use and pastures and crops irrigated. Summary data on irrigation water use is also presented by Natural Resource Management (NRM) regions as additional datacubes. These datacubes can be accessed via the Downloads tab of *Water Use on Australian Farms, 2007–08* (cat. no. 4618.0).

**3** A reduced range of commodity items were collected from the 2007–08 ARMS in comparison to surveys and censuses of previous years. In addition, the range of regional data has been reduced. Care should be taken when comparing estimates over time for Australia, state/territory and regional levels. More information is available upon request.

### GENERAL

**4** Where figures for individual states/territories have been suppressed for reasons of confidentiality, they have been included in relevant totals.

**5** Australian Capital Territory data has been combined with New South Wales data.

**6** Where figures have been rounded, discrepancies may occur between sums of the component items and totals.

### SCOPE AND COVERAGE

**7** The scope of the 2007–08 ARMS was all agricultural businesses recorded on the ABS' Business Register (ABSBR) above a minimum size cutoff. The ABSBR is based on the Australian Business Register (ABR) which is administered and maintained by the Australian Taxation Office (ATO).

**8** A minimum size cut-off of \$5,000 was applied to determine whether a business was in-scope for the 2007–08 ARMS. The measure of size was based on the ABS' Estimated Value of Agricultural Operations (EVAO) or a derived value based on Business Activity Statement (BAS) turnover.

**9** While the ABSBR does not include all agricultural businesses in Australia, it provides improved coverage from the former ABS-maintained Agricultural Survey frame as most businesses and organisations in Australia need to obtain an Australian Business Number (ABN) from the ATO for their business operations. The ABR-based register is also more up-to-date as it excludes agricultural businesses with cancelled ABNs and incorporates regularly updated information on agricultural businesses from the ATO.

**10** The key implication of the move to the ABR-based register is that the data from 2005–06 onwards are not directly comparable with the historical time series of agricultural water data presented for 2003–04 and 2004–05. Therefore, care should be taken in comparing 'Old basis' and 'New basis' estimates.

**11** For the 2007–08 ARMS, a sample of approximately 33,000 agricultural businesses was selected from an in-scope population of approximately 150,000 agricultural businesses.

- AGRICULTURAL BUSINESSES AND AREA UNDER PASTURE OR CROP
- 12** The number of agricultural businesses and the area under pasture or crop are included for irrigation crop categories where these are available. In some cases, the number of agricultural businesses and the area under pasture or crop are not available or may not be directly comparable with the categories used for irrigated crops. More information is available upon request.
- COMPARABILITY WITH AGRICULTURAL COMMODITIES AUSTRALIA
- 13** The estimates of agricultural businesses and area under pasture or crop for 2003–04 have been drawn from *Agricultural Commodities, Australia* (cat. no. 7121.0). These estimates were compiled from the annual Agricultural Survey and Supplementary Collections (i.e. Apples, pears and vineyards). The estimates of agricultural establishments and area under pasture or crop for 2004–05 to 2007–08 presented in this publication differ from *Agriculture Commodities, Australia*, in that the estimates for grapevines in this publication are derived from the Agricultural Survey and ARMS rather than the Vineyards Collection.
- MURRAY-DARLING BASIN GEOGRAPHY
- 14** Data for the Murray–Darling Basin (MDB) region were derived from a concordance of NRM regions falling mostly within the MDB region. The MDB data used in *Water Use on Australian Farms, 2005–06* (cat. no. 4618.0) were derived from geocoded data. Therefore, there will be small differences when comparing these data to 2006–07 and 2007–08 MDB data.
- RESPONSE RATE
- 15** The response rate for the 2007–08 ARMS was 87.4%
- RELIABILITY OF DATA
- 16** The estimates in this publication are subject to sampling and non-sampling errors.
- SAMPLING ERRORS
- 17** The estimates in this publication are based on information obtained from respondents to the ARMS for the year ended 30 June 2008 and are subject to sampling variability. That is, estimates may differ from figures that would be produced if all agricultural businesses had been included in the survey. One measure of the likely difference is given by the standard error (SE), which indicates the extent to which an estimate might vary by chance when not all units have responded, i.e. when a 'sample' of responses only is obtained. There are about two chances in three that a 'sample' estimate will differ by less than one SE from the figure that would have been obtained if all units had responded, and about nineteen chances in twenty that the difference will be less than two SEs.
- 18** In this publication, 'sampling' variability of the estimates is measured by the relative standard error (RSE) which is obtained by expressing the SE as a percentage of the estimates to which it refers.
- 19** Most published estimates have RSEs less than 5%. For some states/territories with limited irrigation of certain commodities or limited numbers of units reporting a particular source of agricultural water, RSEs are greater than 10%. Where the RSE of an estimate included in this publication falls in the range of 10% to less than 25%, it has been annotated with the symbol '^' indicating that the estimate should be used with caution as it is subject to sampling variability too high for some purposes. Where the RSE of an estimate is 25% to 50%, it has been annotated with the symbol '\*', indicating that the estimate should be used with caution as it is subject to sampling variability too high for most practical purposes. Where the RSE of an estimate exceeds 50%, it has been annotated with the symbol '\*\*', indicating that the sampling variability causes the estimate to be considered too unreliable for general use. Separate indication of the RSEs of all estimates is available on request.
- 20** The following table contains estimates of RSEs for a selection of the statistics presented in this publication:

## RELATIVE STANDARD ERRORS OF SELECTED ESTIMATES, by State—2007–08

	Aust.	NSW(a)	Vic.	Qld	SA	WA	Tas.	NT
	%	%	%	%	%	%	%	%
Total area irrigated (ha)	2.1	4.5	5.0	3.3	5.0	5.4	5.3	12.2
Total volume applied (ML)	2.2	4.5	5.2	4.3	5.3	4.8	6.7	17.7
Pasture (including lucerne), cereal and other crops used for grazing - area irrigated (ha)	4.2	8.5	7.2	13.6	10.8	14.5	8.3	29.7
Pasture (including lucerne), cereal and other crops used for grazing - volume applied (ML)	4.2	10.7	7.5	9.9	9.3	11.5	10.1	27.1
Rice - area irrigated (ha)	9.0	9.0	—	—	—	—	—	—
Rice - volume applied (ML)	9.0	9.0	—	—	—	—	—	—
Cotton - area irrigated (ha)	5.9	8.5	—	6.3	—	—	—	—
Cotton - volume applied (ML)	5.0	7.1	—	5.1	—	—	—	—
Sugar cane - area irrigated (ha)	5.6	61.0	—	5.7	—	1.5	—	—
Sugar cane - volume applied (ML)	8.1	69.5	—	8.4	—	0.4	—	—

— nil or rounded to zero (including null cells)

(a) Includes ACT.

## NON-SAMPLING ERRORS

**21** Errors other than those due to sampling may occur because of deficiencies in the list of units from which the sample was selected, non-response, and errors in reporting by providers. Inaccuracies of this kind are referred to as non-sampling errors, which may occur in any collection, whether it be a census or a sample. Every effort has been made to reduce non-sampling error to a minimum by careful design and testing of questionnaires, operating procedures and systems used to compile the statistics.

## RELATED PUBLICATIONS

**22** A range of environmental and agricultural publications are produced by the ABS, including:

- *Agricultural Commodities, Australia* (cat. no. 7121.0)
- *Farm Management and Climate* (cat. no. 4625.0)
- *Natural Resource Management on Australian Farms* (cat. no. 4620.0)
- *Water Access Entitlements, Allocations and Trading* (cat. no. 4610.0.55.003)
- *Water Account, Australia* (cat. no. 4610.0)
- *Water and the Murray–Darling Basin - A Statistical Profile, 2000–01 to 2005–06* (cat. no. 4610.0.55.007)

**23** For more information on other products released by the ABS, please refer to the ABS web site <<http://www.abs.gov.au>>. The ABS also issues a daily Release Advice on the web site which details products to be released in the week ahead. All ABS publications are available free of charge from the ABS website.

## ABS DATA AVAILABLE ON REQUEST

**24** As well as the statistics included in this and related publications, the ABS may have other relevant data available on request. Inquiries should be made to the National Information and Referral Service on 1300 135 070.

## ACKNOWLEDGMENT

**25** ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated. Without it, the wide range of statistics published by the ABS would not be available. The Bureau of Meteorology's contribution of the Climate Conditions Appendix in this publication is especially acknowledged. Information received by the ABS is treated in strict confidence, as required by the *Census and Statistics Act 1905*.

AUSTRALIAN CLIMATE  
CONDITIONS - 2007-08

The major broadscale influence on Australia's climate in 2007-08 was a relatively strong La Niña event, with unusually cool waters in the tropical eastern Pacific developing in late 2007 and persisting into the early months of 2008. Such events are often associated with above-average rainfall through much of Australia. The influence of the 2007-08 La Niña, however, was less extensive than is often the case. The eastern two-thirds of Queensland and the northern half of New South Wales had generally above-average rainfall, with the summer being especially wet, but in much of the rest of the country it was a dry year, exceptionally so in the central continent and most of South Australia.

The major areas with above-average rainfall for the year were Queensland (except the far west), the northern half of New South Wales, the north-western tropics and parts of the western coastal fringe of Western Australia. In scattered locations 2007-08 was among the 10 wettest years on record, particularly in parts of eastern Queensland, the NT Top End, the northern Kimberley and around Shark Bay in Western Australia. 12-month rainfalls were more than 50% above average near Shark Bay, around Emerald, and south of Darwin.

Most of the rain in these areas fell between December and March. December and the first half of January were particularly wet in the east, ultimately resulting in widespread flooding in central Queensland in mid-January. New South Wales ultimately had its wettest summer since 1983-84 (40% above average), and Queensland its wettest since 1990-91.

In contrast, much of the central continent was very dry. Large areas had less than half their normal 12-month rainfall, with areas north of Oodnadatta and straddling the Queensland/NT border northwest of Birdsville receiving less than 50 millimetres for the year. Records were set in a few places. The very dry conditions extended south into most of South Australia, where rainfall was mostly below the 10th percentile, and was 40-80% below average in the north and 20-50% below average in the agricultural regions. The state had its fourth-driest July-June period on record (44% below average), and its driest since 1963-64. The dry conditions also extended, to a lesser extent, into Victoria (10th driest on record) and Tasmania, both of which were mostly 20-40% drier than average. The east coast of Tasmania was especially dry with records set north of Hobart.

Most of these regions got their best rainfall in summer. Autumn was very dry in the south-east, and to some extent over most of the continent; the same was true of August-October 2007.

2007-08 was another rather warm year, especially by day. Daytime maximum temperatures were 0.77°C above average nationally, the fourth-highest value on record. (The four highest values have all occurred in the last six years). South Australia had its warmest days on record, and Victoria and Tasmania both ranked second.

AUSTRALIAN CLIMATE  
CONDITIONS - 2007-08  
*continued*

The only substantial areas where maximum temperatures for the year were below average were in eastern Queensland and parts of the northern tropics, the areas which got the heaviest rains during the summer, and even there only a few places were more than 0.5°C below average. Nearly everywhere else was warmer than average. Maximum temperatures were 1°C or more above average in most of Western Australia outside the tropics, the southern half of the Northern Territory, most of South Australia, northern and western Victoria, the south-western fringe of NSW, and eastern Tasmania. They were more than 2°C above average in parts of inland Western Australia, and 1.5-2°C above average in a broad area of South Australia extending from Ceduna to east of Adelaide.

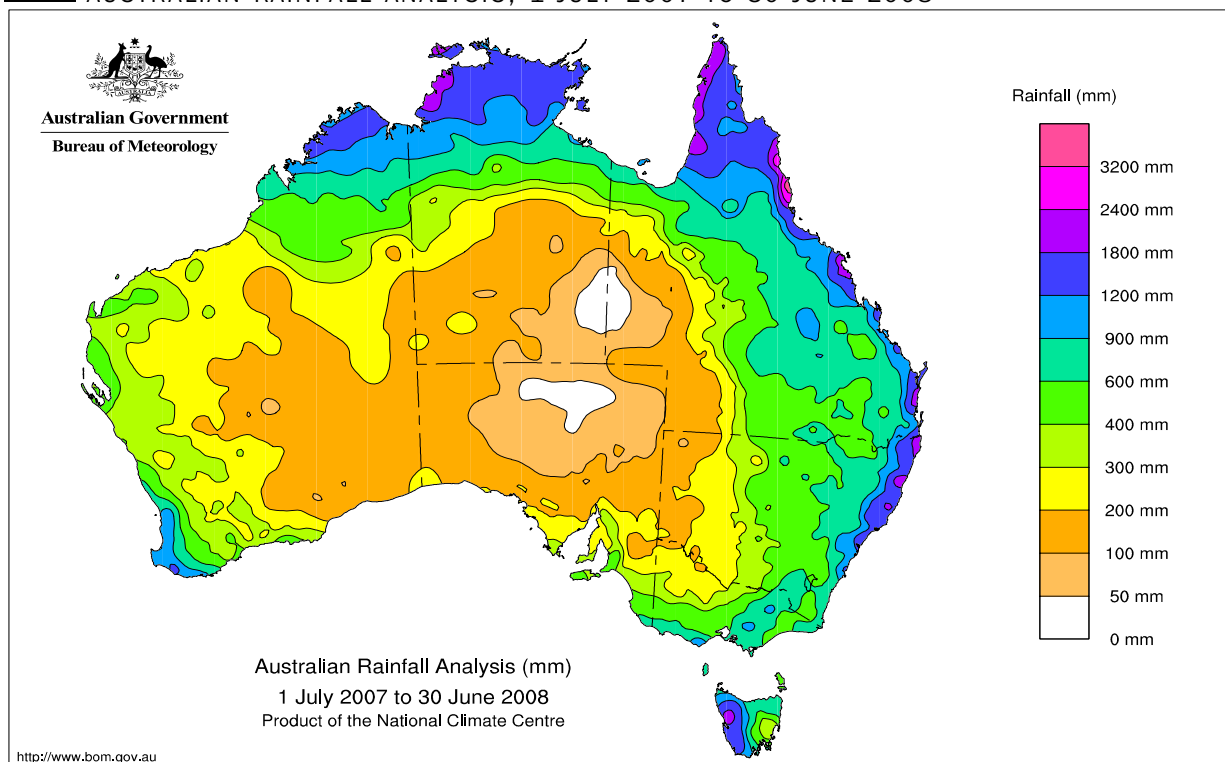
January was Australia's hottest on record, although summer temperatures were close to average after a relatively cool December and February. The most memorable heatwave of the year occurred in March when two weeks of unbroken heat affected much of the south of the continent. Many records for consecutive days of extreme heat were set, with Adelaide experiencing fifteen consecutive days above 35°C (shattering the previous record of eight) and thirteen consecutive days above 37.8°C (100°F). The three months from August to October were also much warmer than normal in many areas.

Overnight minimum temperatures were closer to average; in many of the drier parts of central and southern Australia, consistent clear skies and dry air resulted in a larger-than-normal diurnal temperature range. Over Australia as a whole they were 0.26°C above average (17th highest on record).

Nights were rather cool in the northern tropics, where most areas north of latitude 20°S had below-average minimum temperatures for the year. Eastern Queensland was also rather cool. A particularly cool area was a band extending from the southern Top End of the NT into the northern Kimberley, averaging 1-1.5°C below normal with a few records set. Stanthorpe's -8.8°C on 19 July 2007 was the lowest temperature in Queensland since 1979.

Most of the remainder of Australia had above-average minimum temperatures, but differences from normal were mostly small. Only a few areas were more than 1°C above average, the largest being near the west coast of Western Australia between Geraldton and Onslow. January and June saw extensive above-average overnight temperatures, but in contrast the autumn, particularly April and May, had overnight temperatures which were well below normal through most of eastern Australia.

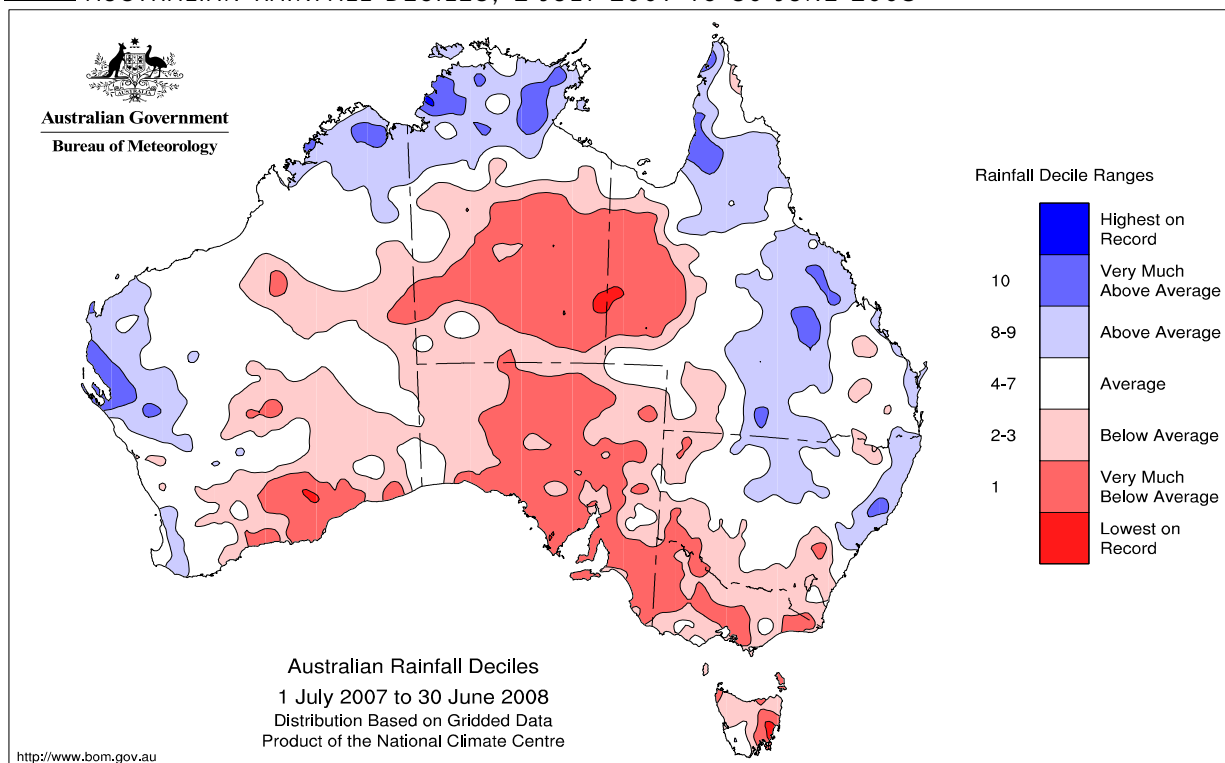
**A1.1** AUSTRALIAN RAINFALL ANALYSIS, 1 JULY 2007 TO 30 JUNE 2008



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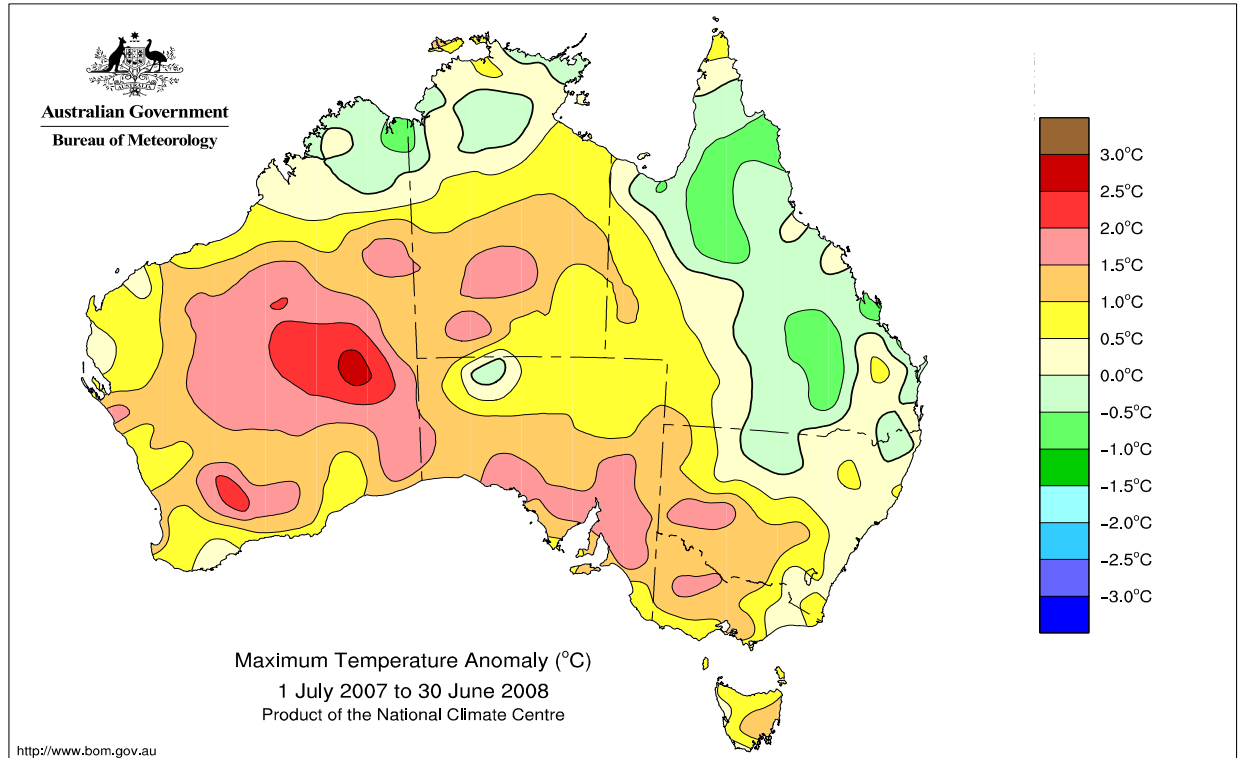
**A1.2** AUSTRALIAN RAINFALL DECILES, 1 JULY 2007 TO 30 JUNE 2008



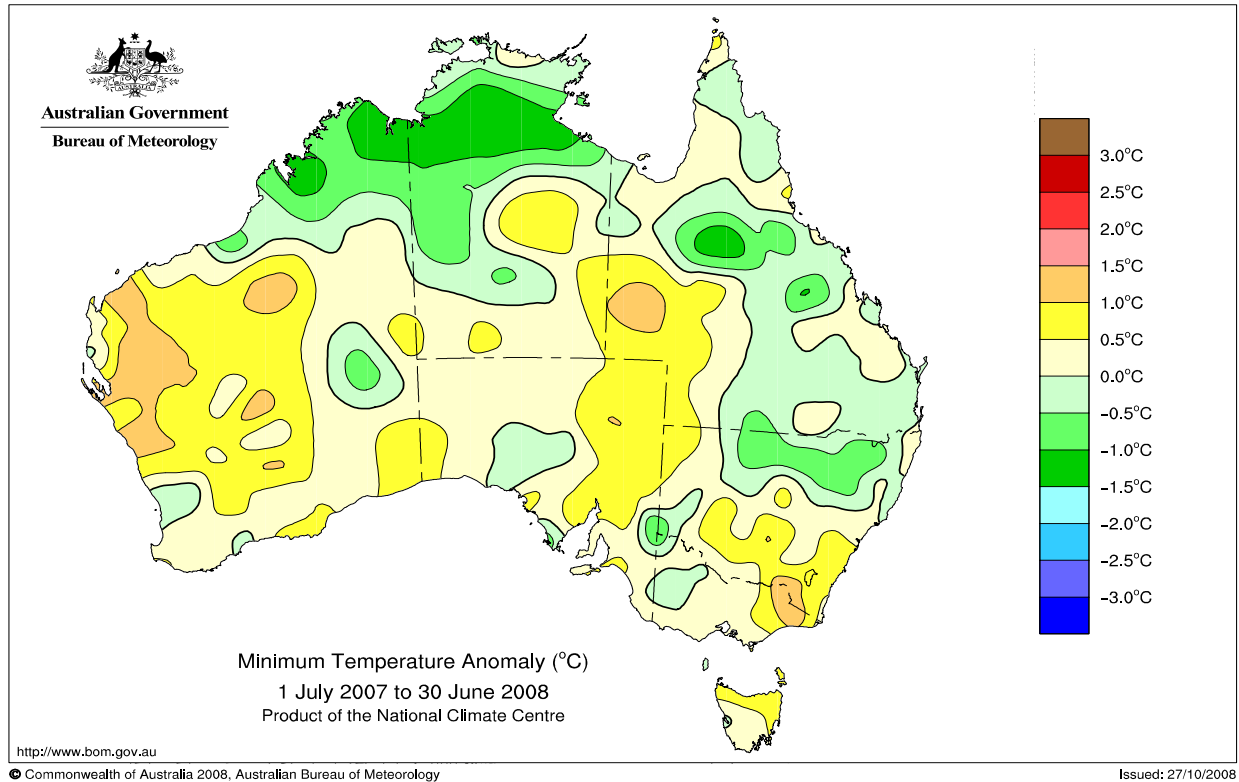
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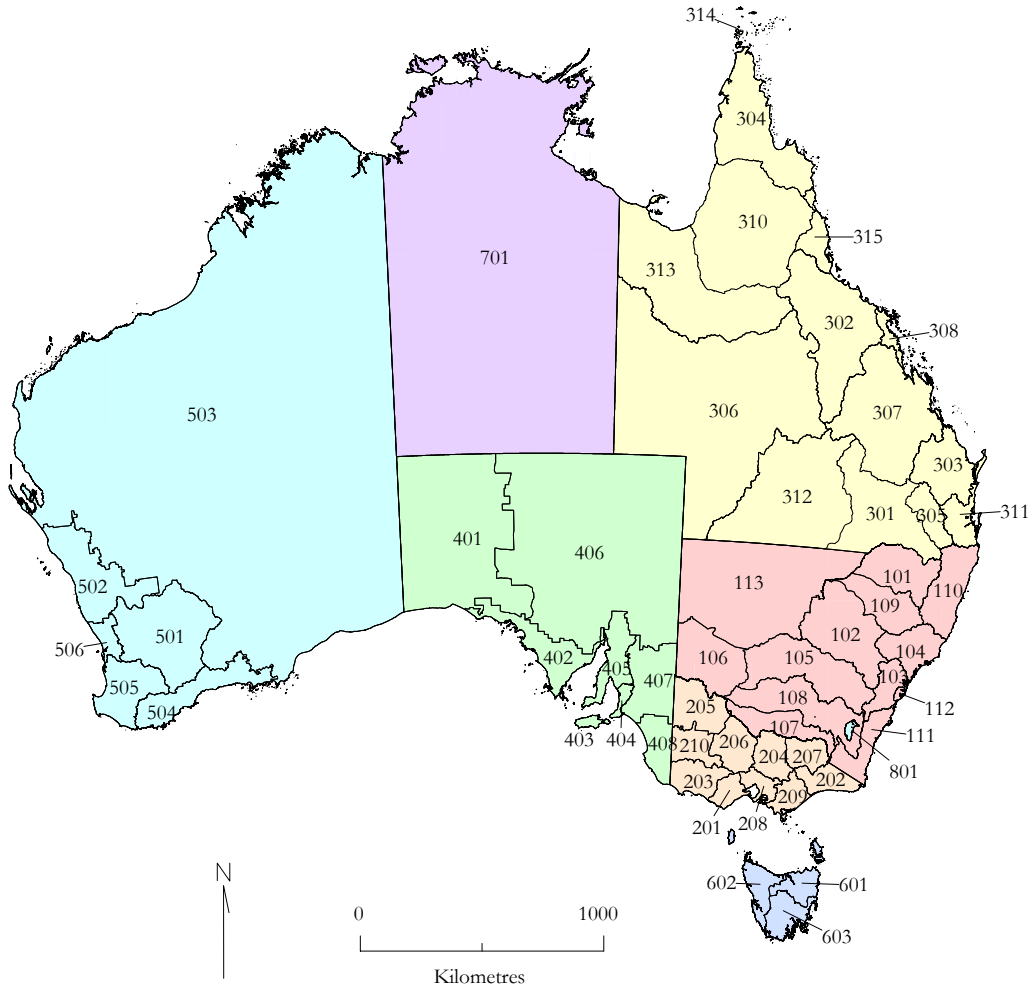
**A1.3** MAXIMUM TEMPERATURE ANOMALY (°C), 1 JULY 2007 TO 30 JUNE 2008



**A1.4** MINIMUM TEMPERATURE ANOMALY (°C), 1 JULY 2007 TO 30 JUNE 2008







NRM Region \*

- |   |   |  |
|---|---|--|
| <ul style="list-style-type: none"> <li>■ NSW</li> <li>101: Border Rivers-Gwydir</li> <li>102: Central West</li> <li>103: Hawkesbury-Nepean</li> <li>104: Hunter-Central Rivers</li> <li>105: Lachlan</li> <li>106: Lower Murray-Darling</li> <li>107: Murray</li> <li>108: Murrumbidgee</li> <li>109: Namoi</li> <li>110: Northern Rivers</li> <li>111: Southern Rivers</li> <li>112: Sydney Metro</li> <li>113: Western</li> </ul> | <ul style="list-style-type: none"> <li>■ QLD</li> <li>301: Border Rivers Maranoa-Balonne</li> <li>302: Burdekin</li> <li>303: Burnett Mary</li> <li>304: Cape York</li> <li>305: Condamine</li> <li>306: Desert Channels</li> <li>307: Fitzroy</li> <li>308: Mackay Whitsunday</li> <li>310: Northern Gulf</li> <li>311: South East (QLD)</li> <li>312: South West (QLD)</li> <li>313: Southern Gulf</li> <li>314: Torres Strait</li> <li>315: Wet Tropics</li> </ul> | <ul style="list-style-type: none"> <li>■ SA</li> <li>401: Alinytjara Wilurara</li> <li>402: Eyre Peninsula</li> <li>403: Kangaroo Island</li> <li>404: Adelaide and Mount Lofty Ranges</li> <li>405: Northern and Yorke</li> <li>406: SA Arid Lands</li> <li>407: SA Murray Darling Basin</li> <li>408: South East (SA)</li> </ul> |
| <ul style="list-style-type: none"> <li>■ VIC</li> <li>201: Corangamite</li> <li>202: East Gippsland</li> <li>203: Glenelg Hopkins</li> <li>204: Goulburn Broken</li> <li>205: Mallee</li> <li>206: North Central</li> <li>207: North East (VIC)</li> </ul>  | <ul style="list-style-type: none"> <li>■ WA</li> <li>501: Avon</li> <li>502: Northern Agricultural Region</li> <li>503: Rangelands (WA)</li> <li>504: South Coast Region</li> <li>505: South West Region</li> <li>506: Swan</li> </ul>  | <ul style="list-style-type: none"> <li>■ TAS</li> <li>601: North (TAS)</li> <li>602: North West (TAS)</li> <li>603: South (TAS)</li> <li>■ NT</li> <li>701: Northern Territory</li> <li>■ ACT</li> <li>801: ACT</li> </ul>   |

\*Numbers used are NRM codes.  
Source: Department of the Environment and Heritage - 2008.

## GLOSSARY .....

<b>Agricultural business</b>	A business which is engaged in agricultural activities above a minimum size (\$5,000, based on EVAO or a derived value based on Business Activity Statement (BAS) Turnover).
<b>Application rate</b>	The rate at which water is applied to an area or crop. Measured in megalitres per hectare, application rate is calculated by dividing the total area of interest by the total volume applied to the area.
<b>Area of agricultural holding</b>	Includes all occupied and maintained land owned, leased or rented, land worked by sharefarmers and all road permits by a particular agricultural establishment. Excludes land leased or rented to others.
<b>Area of agricultural land</b>	Refers to the area of agricultural holding of in-scope agricultural businesses. This is not equal to the area under pasture or crop as not all land on agricultural holdings is under pasture or crop.
<b>Estimated value of agricultural operations (EVAO)</b>	An estimation of the value of agricultural activity undertaken by an agricultural business. Three-year average weighted prices are applied to livestock turnoff and livestock numbers on the farm, and to area and production data for crops. The resultant aggregation of these commodity values is EVAO. It is not an indicator of the value of receipts of individual farms, but rather, an indicator of the extent of agricultural activity.
<b>Gigalitre</b>	One thousand million litres.
<b>Megalitre</b>	One million litres.



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