AGRICULTURE VICTORIA

Agriculture Victoria Research: GMID Land & Water Analysis : Dairy Murray Muster 2021

Dairy Australia
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Australian Government
Department of Agriculture

Rural Research and Development for Profit
Keeping Australian farmers at the cutting edge

NORTH CENTRAL Catchment Management Authority
Connecting Rivers, Landscapes, People

GOULBURN BROKEN CATCHMENT MANAGEMENT AUTHORITY

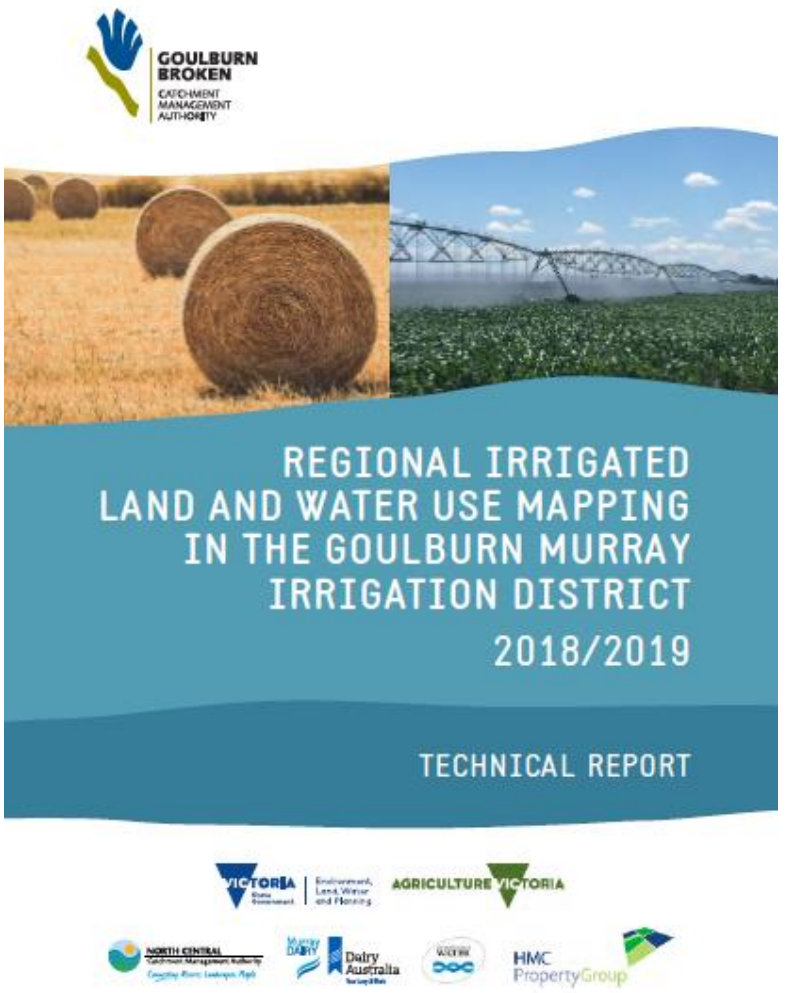
VICTORIA State Government | Environment, Land, Water and Planning

GOULBURN-MURRAY WATER

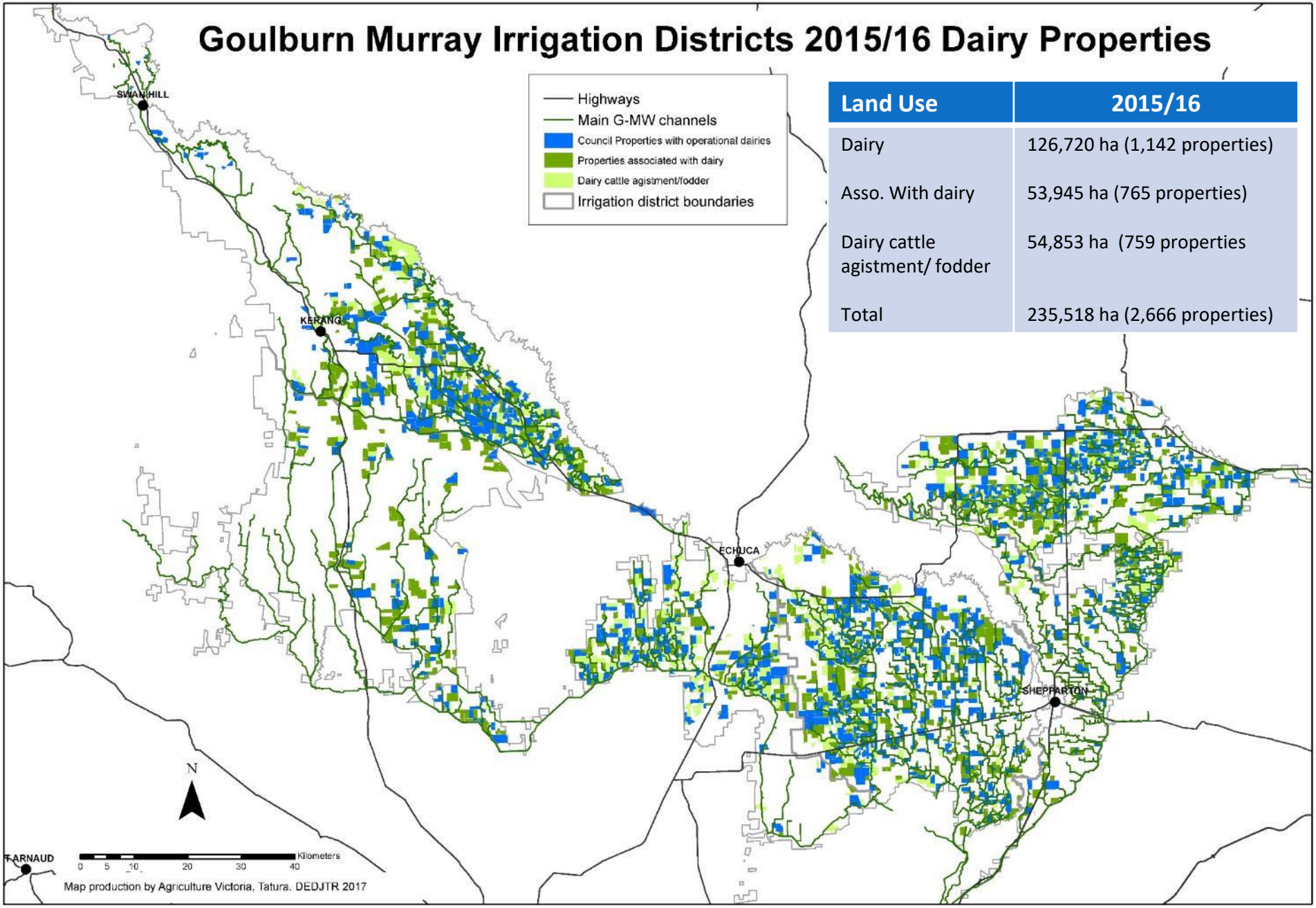
VICTORIA State Government | Jobs, Precincts and Regions

Spatial Information Sciences: Spatial Land & Water Assessment

Regional Land and Water Study Updates



Goulburn Murray Irrigation Districts 2015/16 Dairy Properties



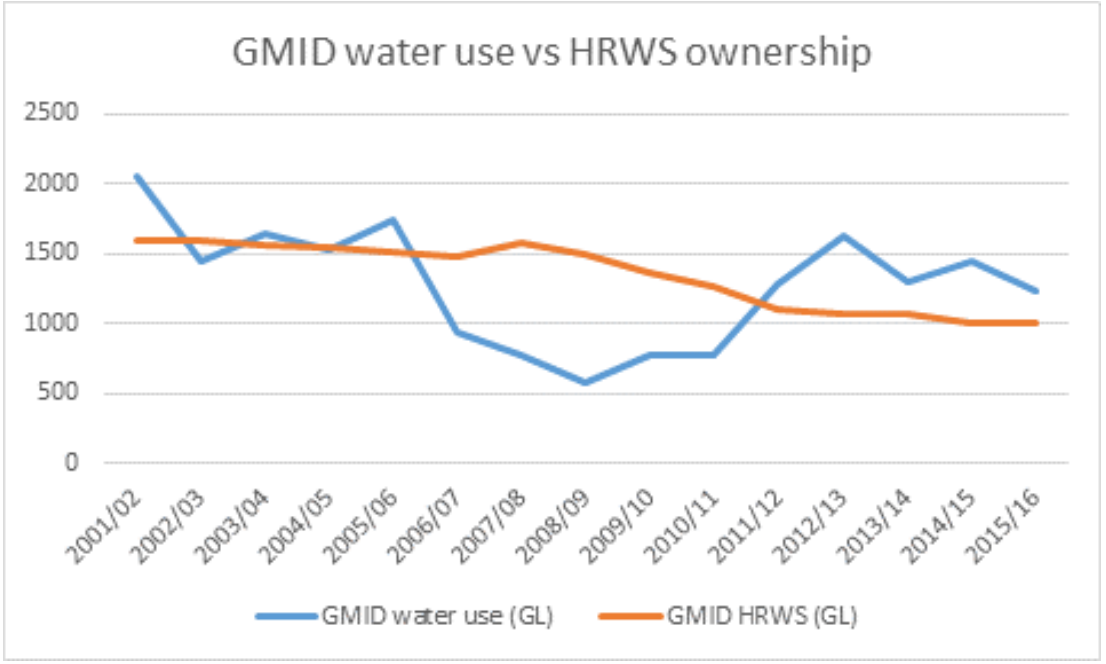
Land Use	2015/16
Dairy	126,720 ha (1,142 properties)
Asso. With dairy	53,945 ha (765 properties)
Dairy cattle agistment/ fodder	54,853 ha (759 properties
Total	235,518 ha (2,666 properties)

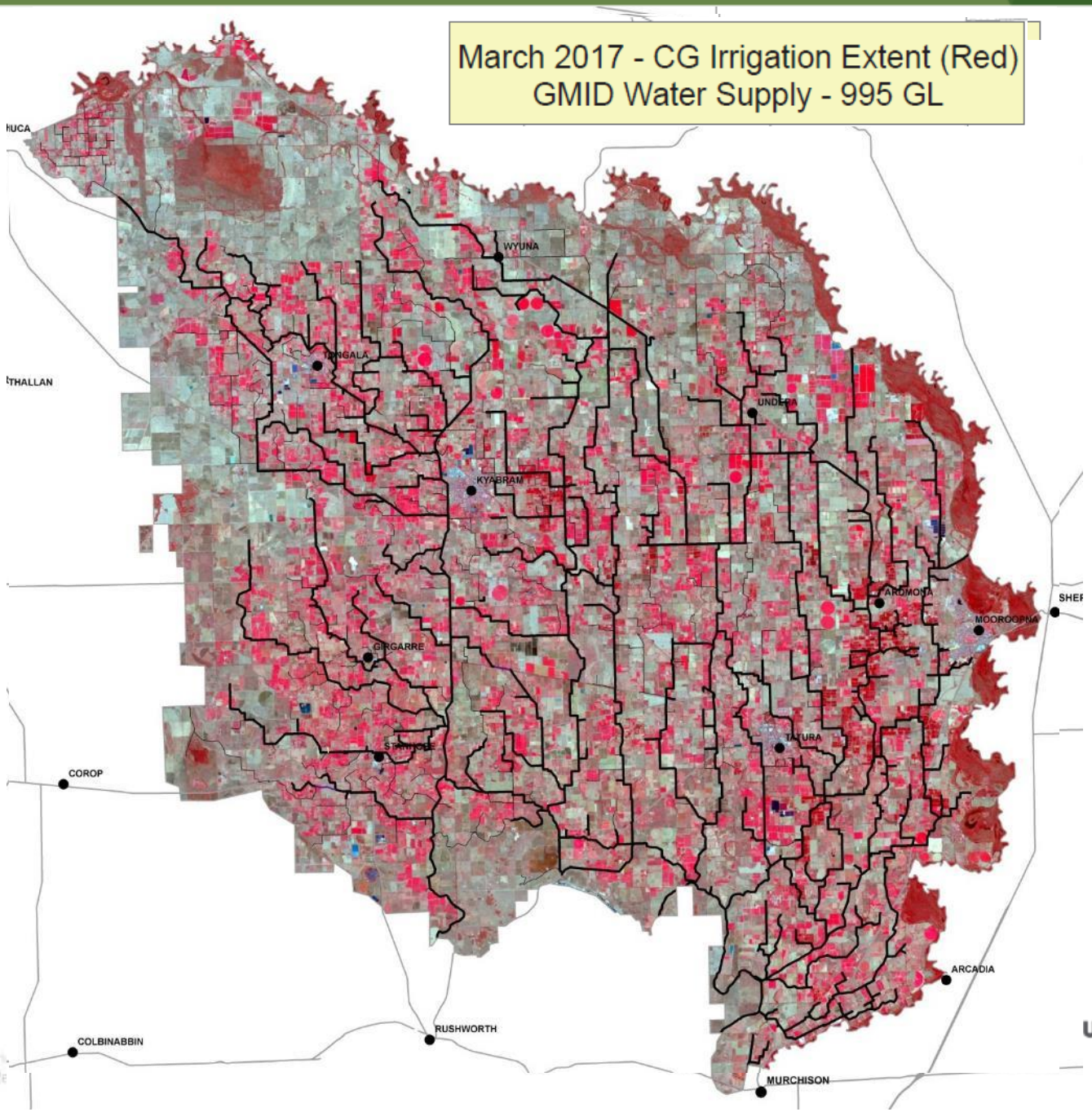
Water use change in the GMID and dairy industry

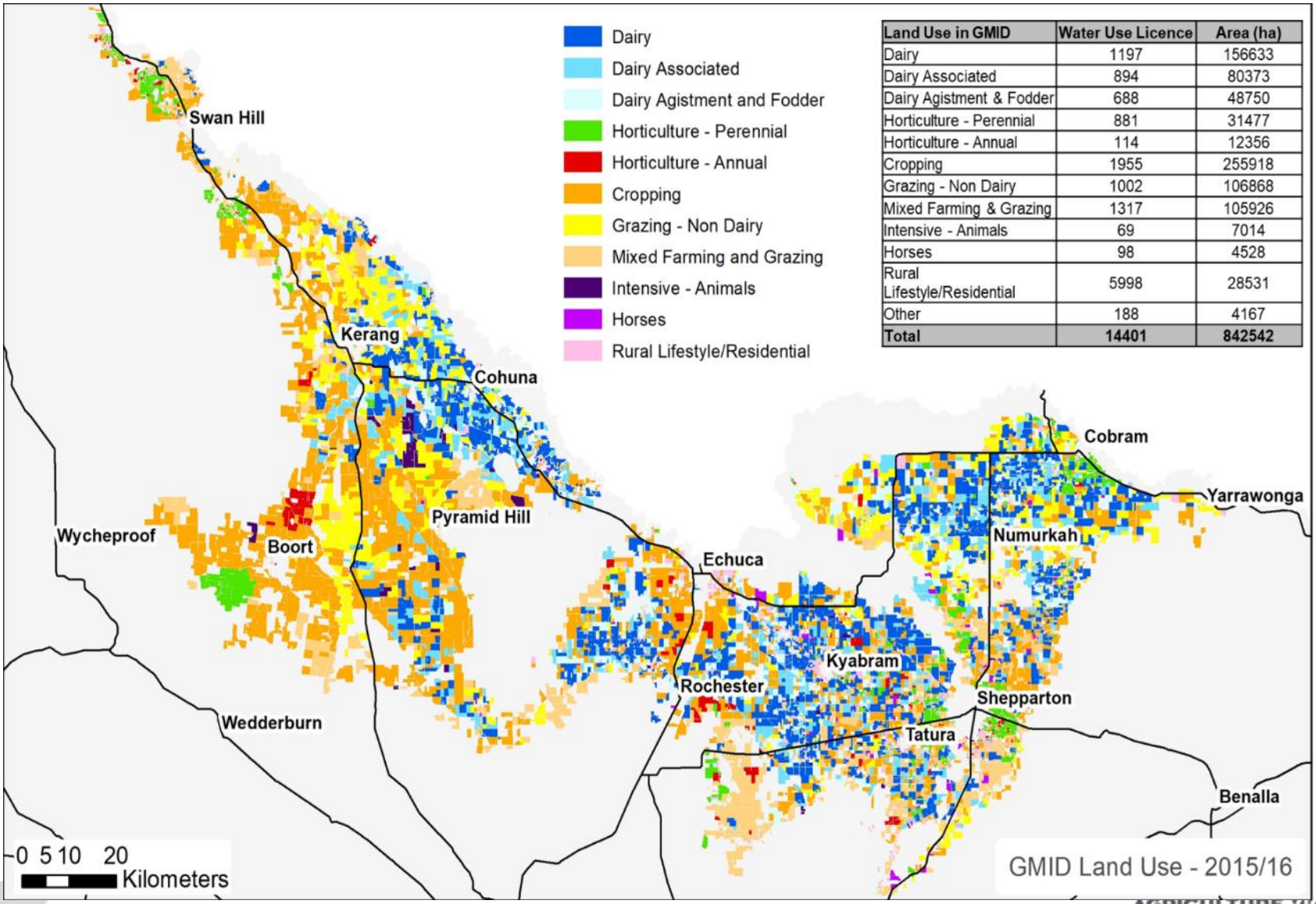
Year	GMID HRWS (GL)	GMID water use (GL)	Dairy HRWS (GL)	Dairy water use
2001/02	1597	2053	819	1065
2002/03	1598	1450		
2003/04	1567	1652	709	922
2004/05	1543	1534		
2005/06	1517	1739		
2006/07	1480	945		
2007/08	1585	769		
2008/09	1490	574		
2009/10	1365	774		
2010/11	1273	772		
2011/12	1103	1286		
2012/13	1068	1622	470	746
2013/14	1068	1295		
2014/15	1000	1456	465	740
2015/16	1000	1230	465	600
2017/18	1080	1312	350	585

- Reduction in entitlement and use between 2001/02 - 2015/16 for GMID and dairy industry

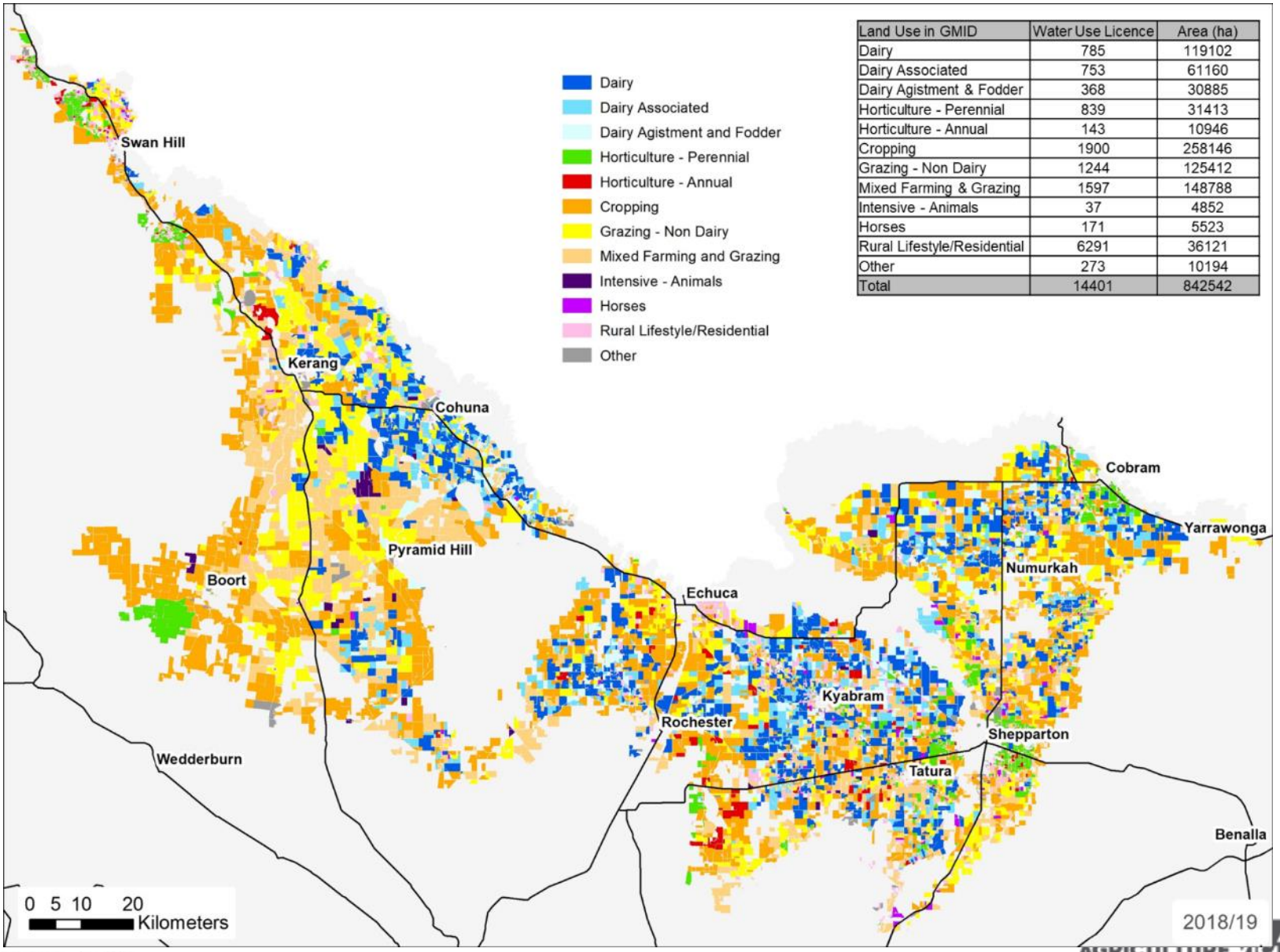
- An increased reliance on the allocation (temporary) trade market generally in GMID, with an increased gap in HRWS ownership pre and post-drought years



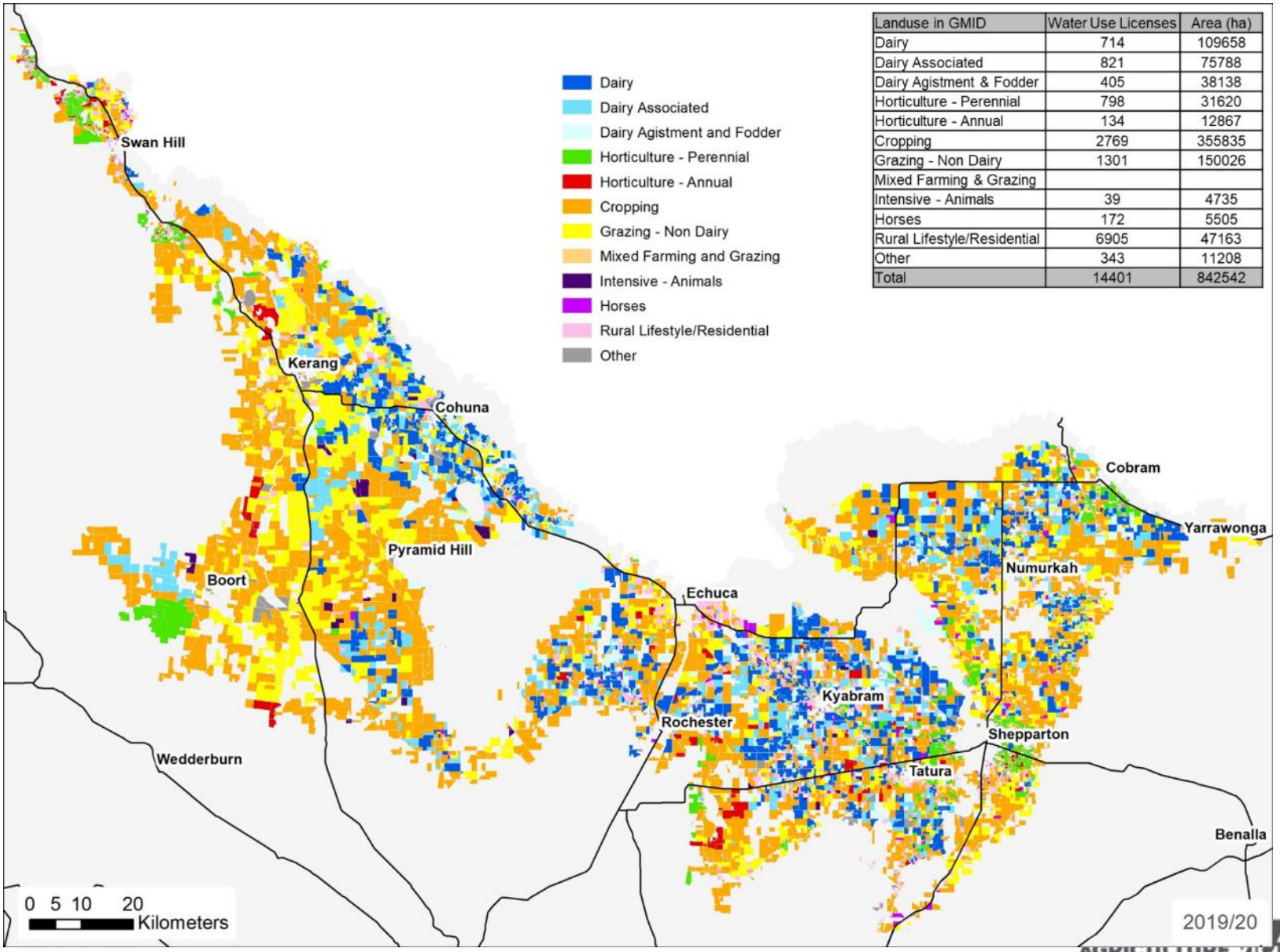

March 2017 - CG Irrigation Extent (Red)
GMID Water Supply - 995 GL
WYUNA
KYABRAM
ARDMONA
MOOROOPNA
GIRGARRE
TATURA
COROP
ARCADIA
RUSHWORTH
COLBINABBIN
MURCHISON



Land Use in GMID	Water Use Licence	Area (ha)
Dairy	1197	156633
Dairy Associated	894	80373
Dairy Agistment & Fodder	688	48750
Horticulture - Perennial	881	31477
Horticulture - Annual	114	12356
Cropping	1955	255918
Grazing - Non Dairy	1002	106868
Mixed Farming & Grazing	1317	105926
Intensive - Animals	69	7014
Horses	98	4528
Rural Lifestyle/Residential	5998	28531
Other	188	4167
Total	**14401**	**842542**



Land Use in GMID	Water Use Licence	Area (ha)
Dairy	785	119102
Dairy Associated	753	61160
Dairy Agistment & Fodder	368	30885
Horticulture - Perennial	839	31413
Horticulture - Annual	143	10946
Cropping	1900	258146
Grazing - Non Dairy	1244	125412
Mixed Farming & Grazing	1597	148788
Intensive - Animals	37	4852
Horses	171	5523
Rural Lifestyle/Residential	6291	36121
Other	273	10194
Total	14401	842542

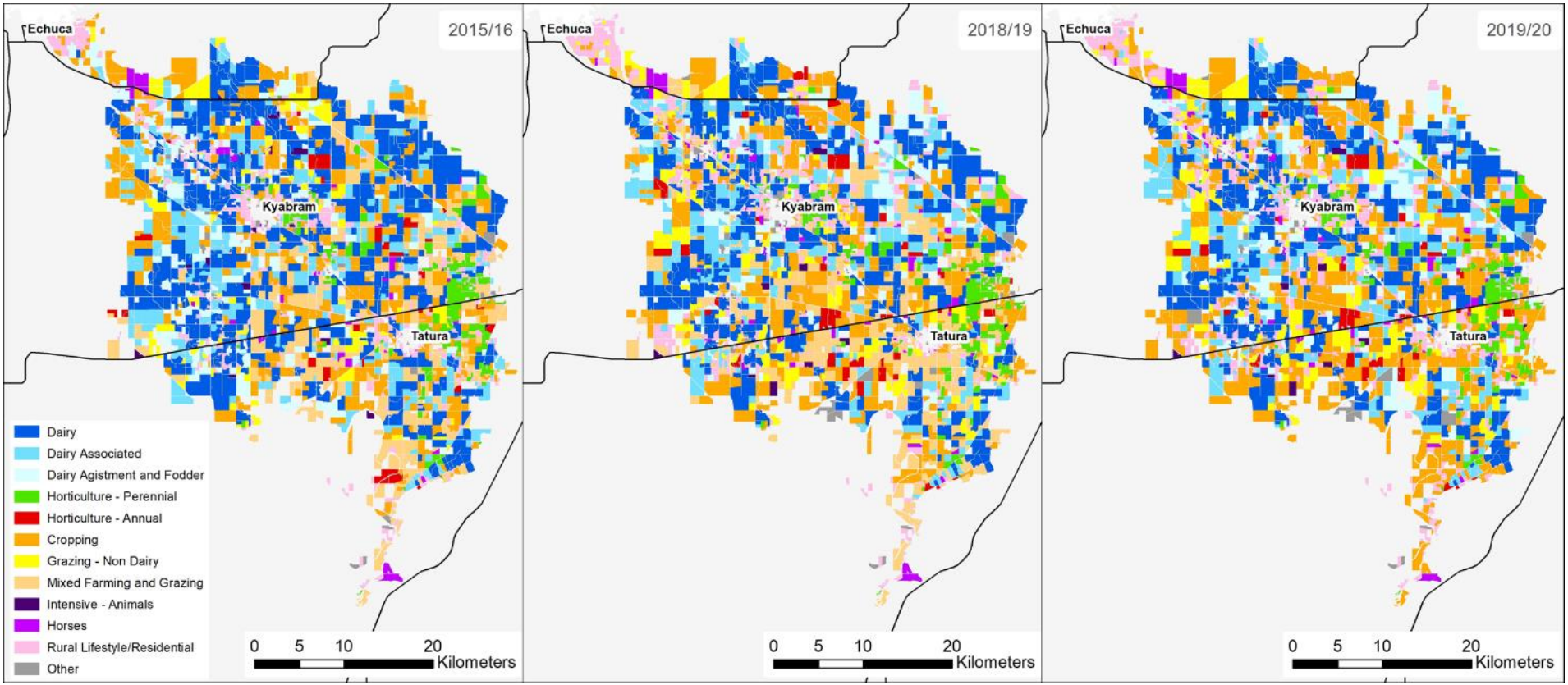


Landuse in GMID	Water Use Licenses	Area (ha)
Dairy	714	109658
Dairy Associated	821	75788
Dairy Agistment & Fodder	405	38138
Horticulture - Perennial	798	31620
Horticulture - Annual	134	12867
Cropping	2769	355835
Grazing - Non Dairy	1301	150026
Mixed Farming & Grazing		
Intensive - Animals	39	4735
Horses	172	5505
Rural Lifestyle/Residential	6905	47163
Other	343	11208
Total	14401	842542

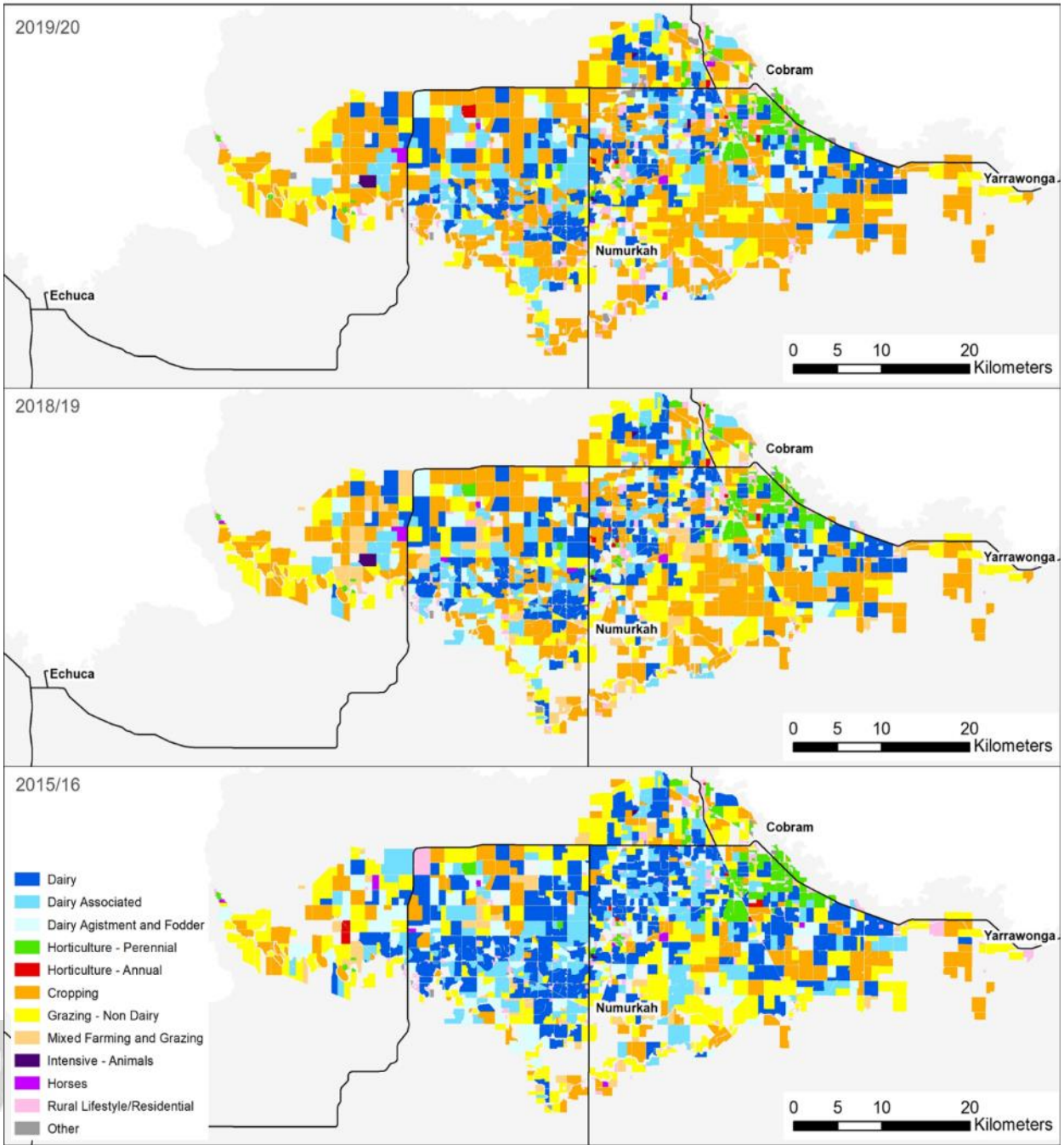
GMID Land Use areas

	2016	2019	2020	2016-2020	
Primary Landuse	Area (ha)	Area (ha)	Area (ha)	Change in Area (ha)	Change in Area (%)
Cropping	255918	258146	355835	99917	39.0
Dairy	156633	119102	109658	-46976	-30.0
Dairy Agistment & Fodder	48750	30885	38138	-10612	-21.8
Dairy Associated	80373	61160	75788	-4585	-5.7
Grazing - Non Dairy	106868	125412	150026	43158	40.4
Horses	4528	5523	5505	977	21.6
Horticulture - Annual	12356	10946	12867	511	4.1
Horticulture - Perennial	31477	31413	31620	143	0.5
Intensive - Animals	7014	4852	4735	-2279	-32.5
Mixed Farming & Grazing	105926	148788			
Rural Lifestyle/Residential	28531	36121	47163	18632	65.3
Other	4167	10194	11208	7040	168.9
Total	842542	842542	842542		

Central Goulburn



Murray Valley



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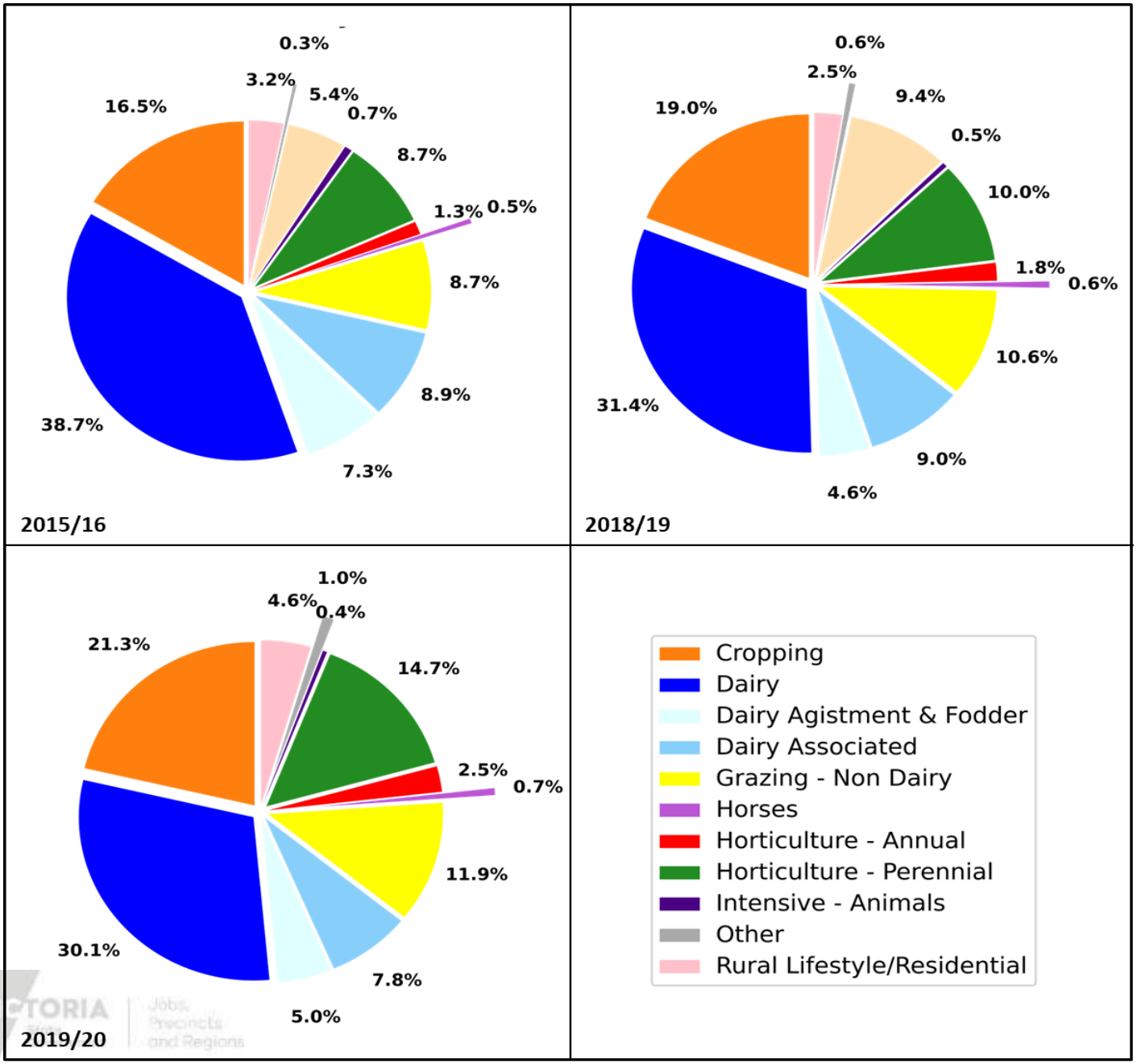


Share of GMID water use by landuse (2015/16, 2018/2019, 2019/20)

Regional Project Update – Farm Irrigation Survey

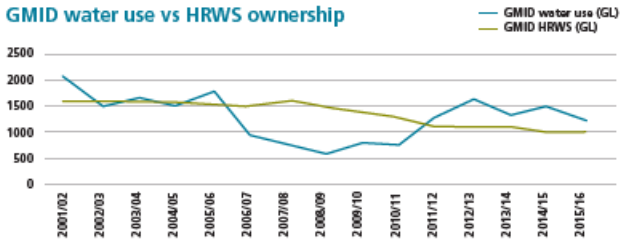
- Program started in Shepparton Irrigation Region
  - GMW Water Bailiff led program dating back many decades (e.g. Irrigator Census)
  - 2004/05 -
  - 2009/10 –
- GMID wide program
  - 2015/16 – Farm Irrigation Survey
  - 2019/20 –Farm Irrigation Survey
- Purpose is to compliment the Spatial Mapping and provide greater insight in to behaviours of irrigators in terms of
  - Irrigation infrastructure management / barriers
  - Farm management / natural resource management
  - Water management / allocation trade, carry over, price
  - Farm context and irrigation systems
  - Modernisation of supply, funding etc
  - Changed land use, transition permanent or seasonal

LAND & WATER USE MAPPING

GMID 2015/16[1]

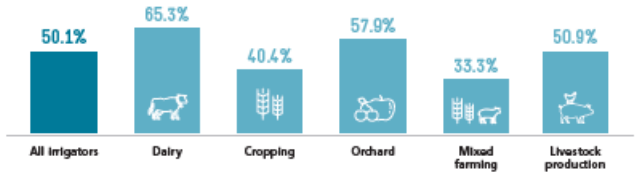
The overarching picture is that the land use and water use profile in the GMID is changing in response to seasonal fluctuations, dimate change, commodity prices and changes in water and planning policy.

GMID water use vs HRWS ownership



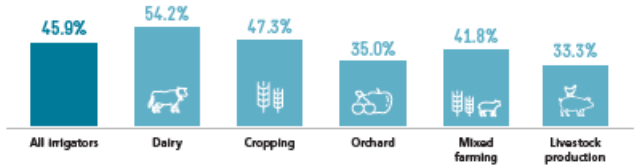
This data indicates that the amount of High Reliability Water Share (HRWS) held by irrigators (GL) was less than the amount of water used in the season of 2015/16, meaning use of the allocation trade market.

Irrigation infrastructure upgraded since last five years



This data indicates that 50% of irrigators' had upgraded their on-farm irrigation infrastructure between 2010/11 and 2015/16, with dairy farmers and orchardists' having the highest percentage of uptake.

Allocation trade forms a large part of farm water use



45.9% of irrigators said allocation trade forms a large part of their farm water use. Dairy highest (54.2%) and horticulture lowest (35%).

The top three barriers in 2015/16 to upgrading on-farm irrigation infrastructure included:

1. Uncertainty of water allocation **(53.9%)**
2. Lack of financial resources **(52.6%)**
3. Inadequate water availability **(46.1%)** (which increased from 19.3% in the 2004/05 survey).

49%

of irrigators reported owning less than 200ML of HRWS, including 8% owning no water share.

64%

of respondents said that they did not own enough water entitlements to meet their irrigation needs.

73.5%

of dairy respondents said that they do not have the amount of water entitlements they require.

Farm Irrigation Survey – Previous Data

CASE STUDY: DECISIONS ABOUT LAND USE

Bob* has owned his 250 ha irrigated cropping farm near Undera for almost 40 years. He grows a wide range of fodder and grain crops and has a small area of orchard on the property, one of three farms. The property is connected to the main channel system but due to the uncertainty around water available and pricing, he has decided against further irrigation upgrades.

Each year Bob makes decisions about what to grow depending on water and commodity prices. Depending on those decisions, Bob then uses a mixture of groundwater, HRWS and internal and trade allocations, to ensure he has the water he needs to meet his farm production needs.

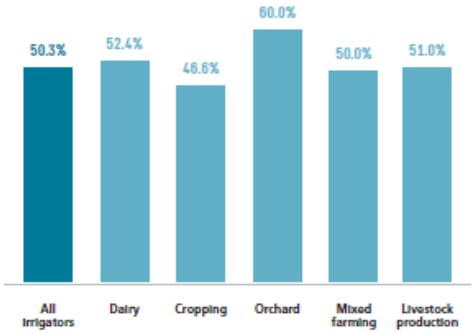
*name has been changed

Price above which temporary water becomes unviable

Industry	Number of respondants	Less than $150/ML	$150-200/ML	$201-250/ML	More than $250/ML
Dairy	73	26.0%	56.2%	12.3%	5.5%
Cropping	67	41.8%	31.3%	23.9%	3.0%
Orchard	12	8.3%	16.7%	41.7%	33.3%
Mixed Farming	38	52.6%	36.8%	7.9%	2.6%
Livestock production	32	21.9%	53.1%	25.0%	0.0%
All irrigators	222	33.7%	42.8%	18.5%	5.0%

Respondents were highly sensitive to allocation trade (temporary) water price, with **76.5%** of all irrigators' indicating that water prices greater than $200/ML were not viable for their business. Victorian water trade data (2016) identified that the annual weighted average price of temporary water in the southern Basis was $220/ML and peaked at $250/ML in May 2016.

Pass property to another person in the family?



50.3% planned to pass their property to another person in the family, highest for horticulture **(60%)** and lowest for cropping **(46.6%)**. This was similar to responses in 2004/5 **(51.2%)**.

For the 2015/16 irrigation season, respondents reported growing annual pasture **(53.9%)**, perennial pasture **(34.4%)**, winter grain/fodder **(32%)**, lucerne **(27.9%)** and summer grain/ fodder **(9.6%)** (multiples applied).

96.5% of respondents owned their properties (not leased). **53.5%** said that they expect to continue operating for more than 10 years, up from **45.8%** in 2004/5.

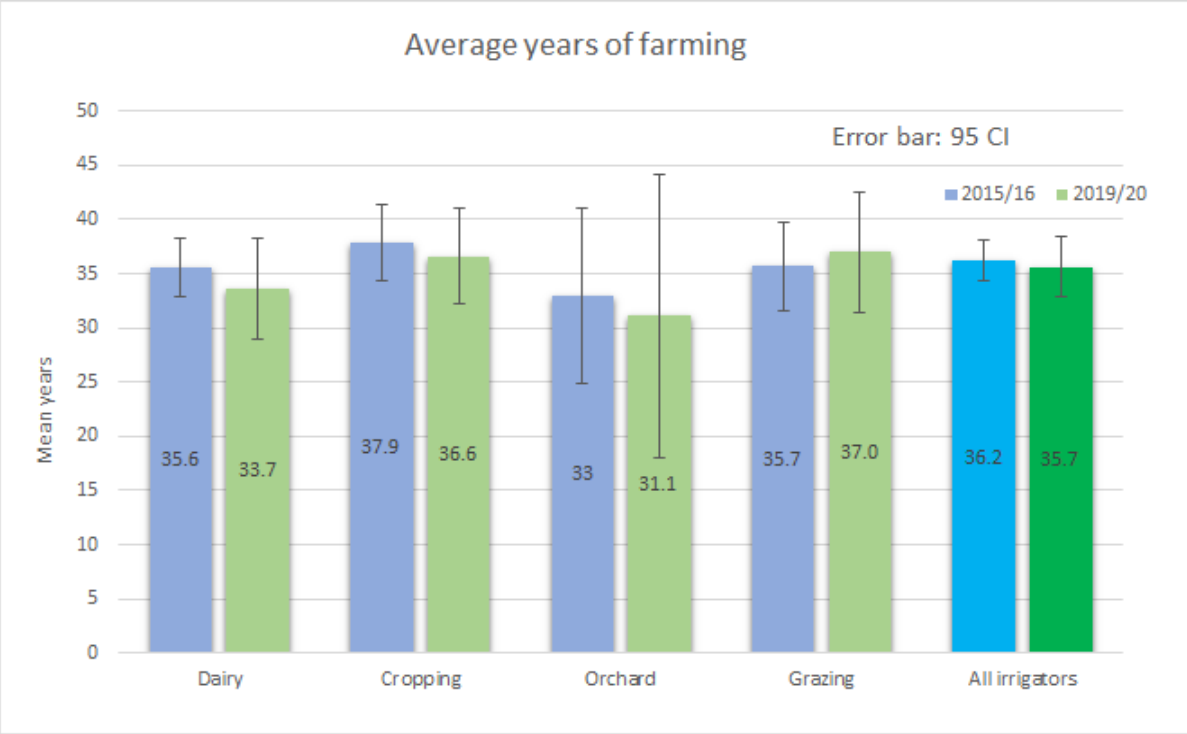
Average years irrigators' had been farming **36.2 years**, highest for cropping land use **(37.9 years)** and lowest for horticulture land use **(33 years)**.

Farm Irrigation Survey – Previous Data

Farm Irrigation Survey Draft Findings - 2019/20

31.5% response rate

Industry	Sample size based on WUL nos.	Response nos.
Dairy	100 (25.0)	29 (21.6)
Cropping	100 (25.0)	54 (40.3)
Horticulture	52 (13.0)	12 (9.0)
Livestock production	148(37.0)	39 (29.1)
Total	400 (100)	134(100)



Succession planning

- 54.6% plan to pass property to another person in the family
- 50.3% in 2015/16. No association between industry. However, found significant correlation for those planning on passing property to family members (had a higher average years of farming (40.6 years)), compared to those who have no intention of passing property to family members (29.7 years).

- 35.7 years average farming.
- 83.5% own properties in 2019/20; compared to 96.5% in 2015/16.
- Increase in number of irrigators who own, lease and manage (3.5% to 15.1%) suggesting change to agricultural business models and risk management.

Farm Irrigation Survey Draft Findings - 2019/20

Proportion of irrigators growing major crops/pasture on their property (%)

Industry	Perennial pasture	Annual pasture	Lucerne	Winter grain/fodder	Summer grain/fodder
Dairy	51.7	93.1	31.0	48.3	13.8
Cropping	20.4*	46.3	40.7	77.8	9.2
Horticulture	-	-	-	-	-
Grazing	41.0	58.9	17.9	12.8	0.0
All irrigators [1] (2019/20)	34.4	61.5	31.1	50.0	7.4
All irrigators 1 (2015/16)	**34.4**	**53.9**	**27.9**	**32.0**	**9.6**

#Multiple responses were permitted ***Some cropping also had small amount of grazing land use such as Ryegrass**

Annual pasture dominant land cover (61.5%)

Winter Grain/ Fodder (50%)

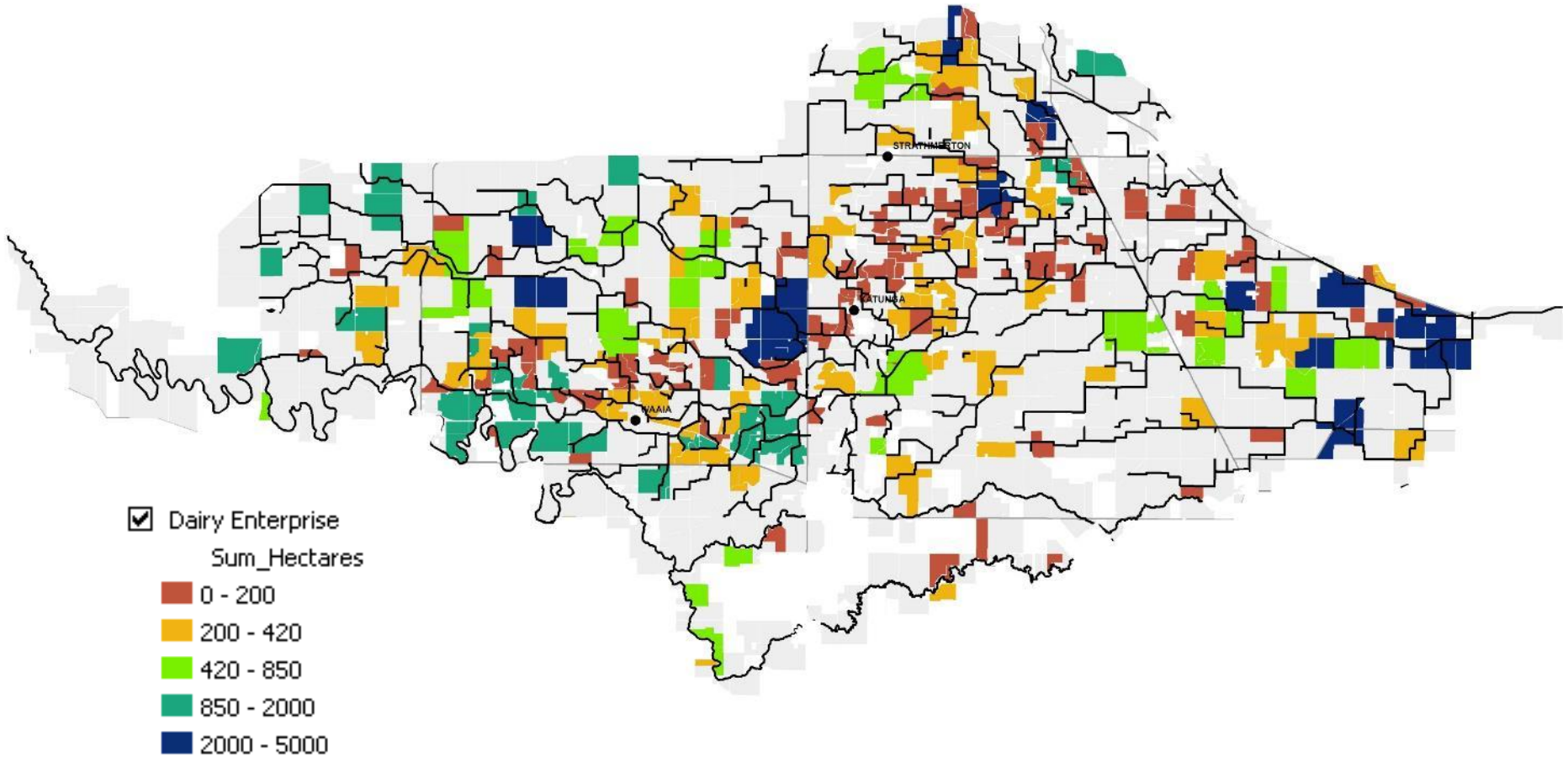
Proportion of irrigators using different irrigation methods on their properties (%)

Industry	Gravity channel irrigation	Pipe and riser	Centre pivot and linear move	Fixed sprinkler systems	Micro drip and sub- surface irrigation
Dairy	96.4	42.9	7.1	3.6	0.0
Cropping	94.3	28.3	11.3	3.8	3.8
Orchard	0.0	27.3	0.0	3.6	90.9
Grazing	92.3	17.9	2.6	3.6	2.6
All irrigators [1] (2019/20)	86.3	28.2	6.9	3.8	9.9
All irrigators 1 (2015/16)	**76.8**	**12.0**	**2.9**	**2.3**	**3.9**

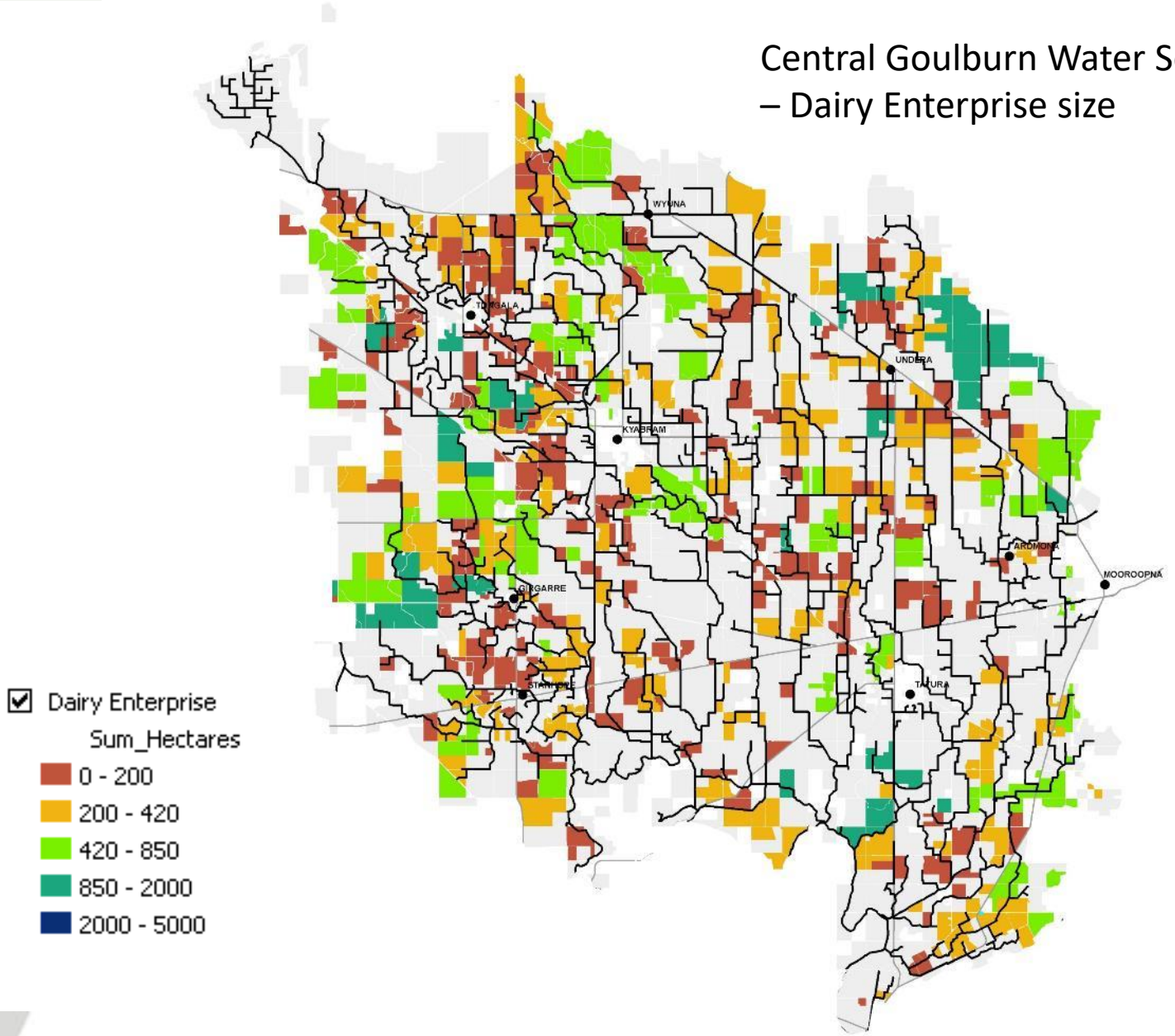
Gravity channel remains dominant overall irrigation method 86.3%

Horticulture use micro drip and sub-surface irrigation 90.9%

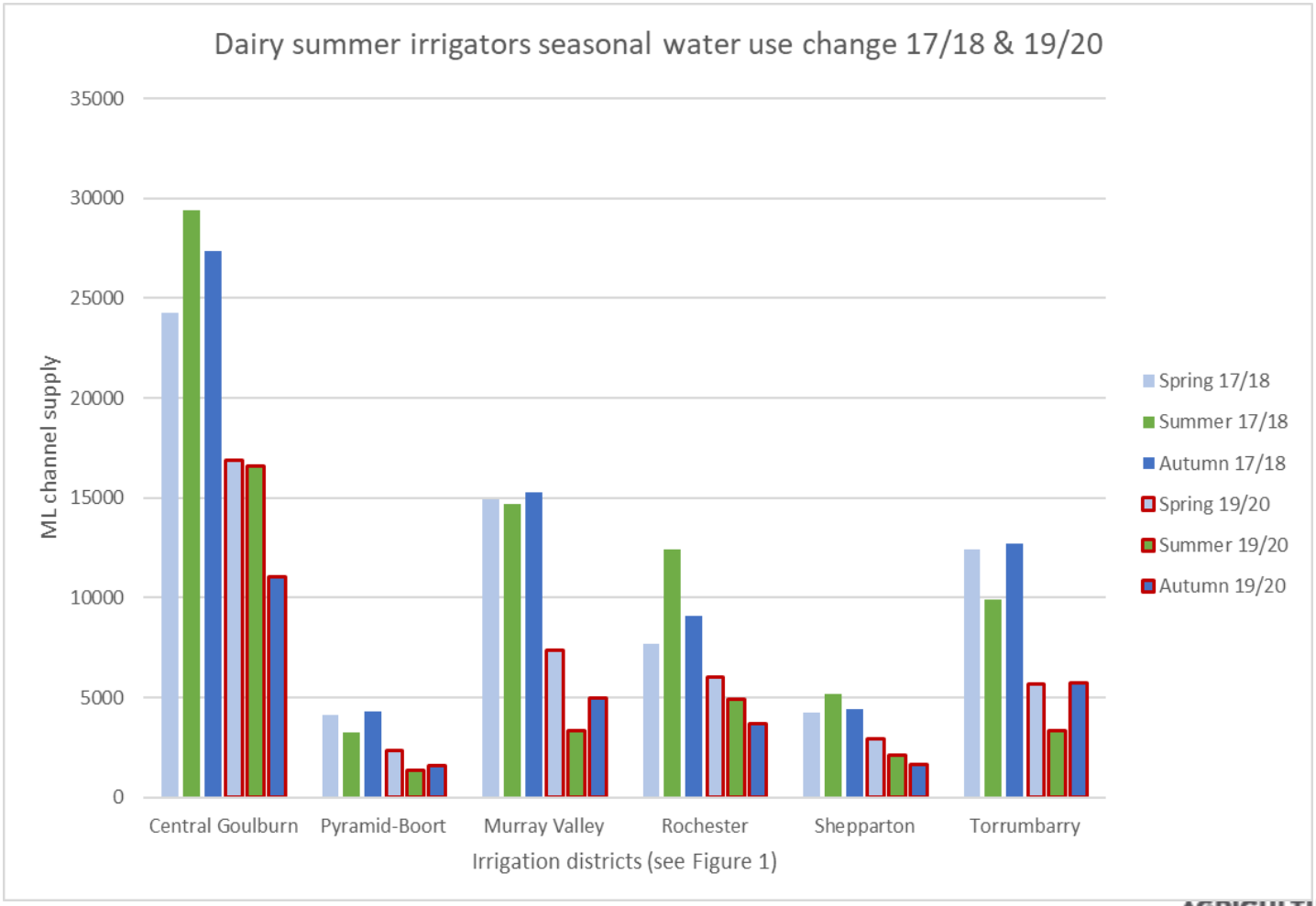
Murray Valley Water Services Area – Dairy Enterprise size



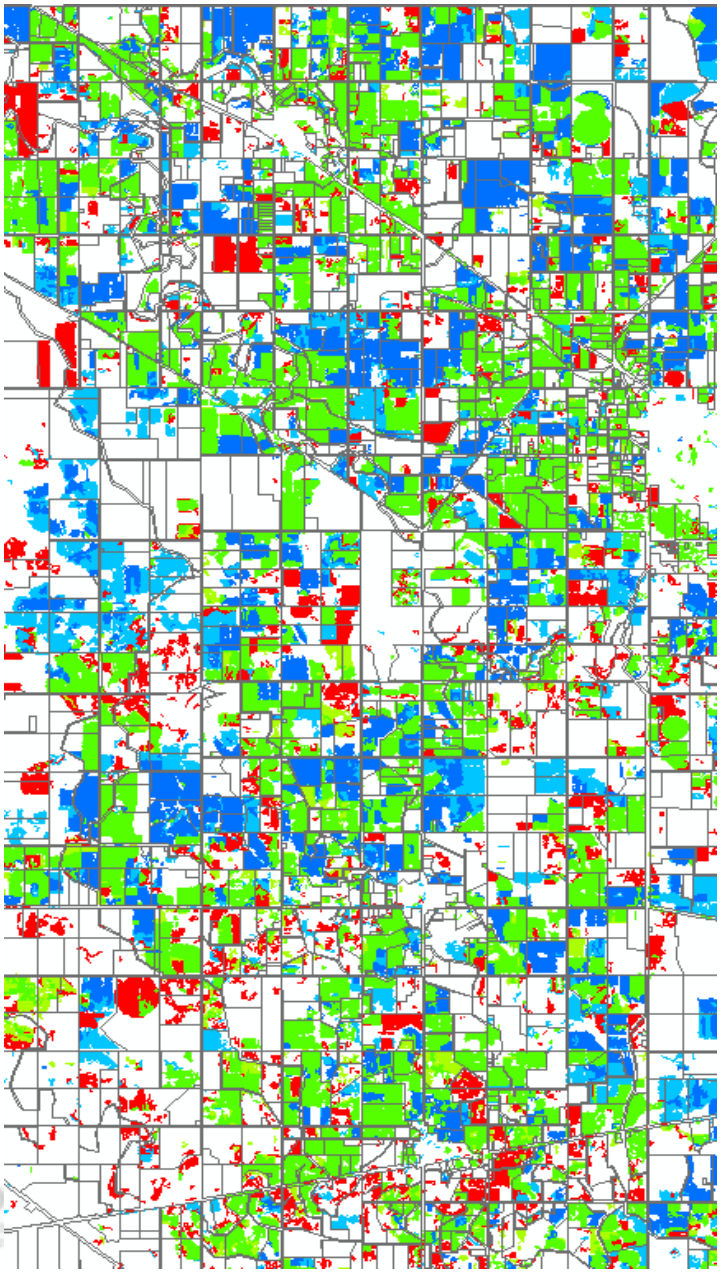
Central Goulburn Water Services Area – Dairy Enterprise size

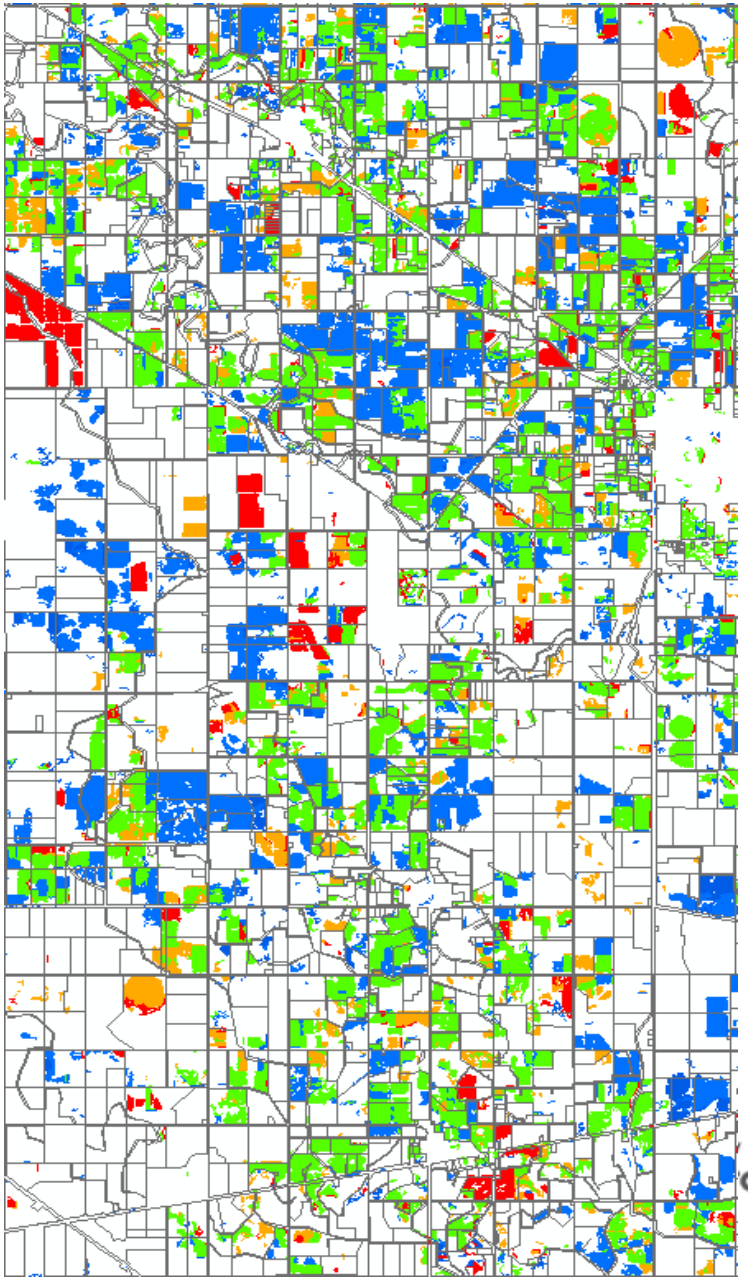


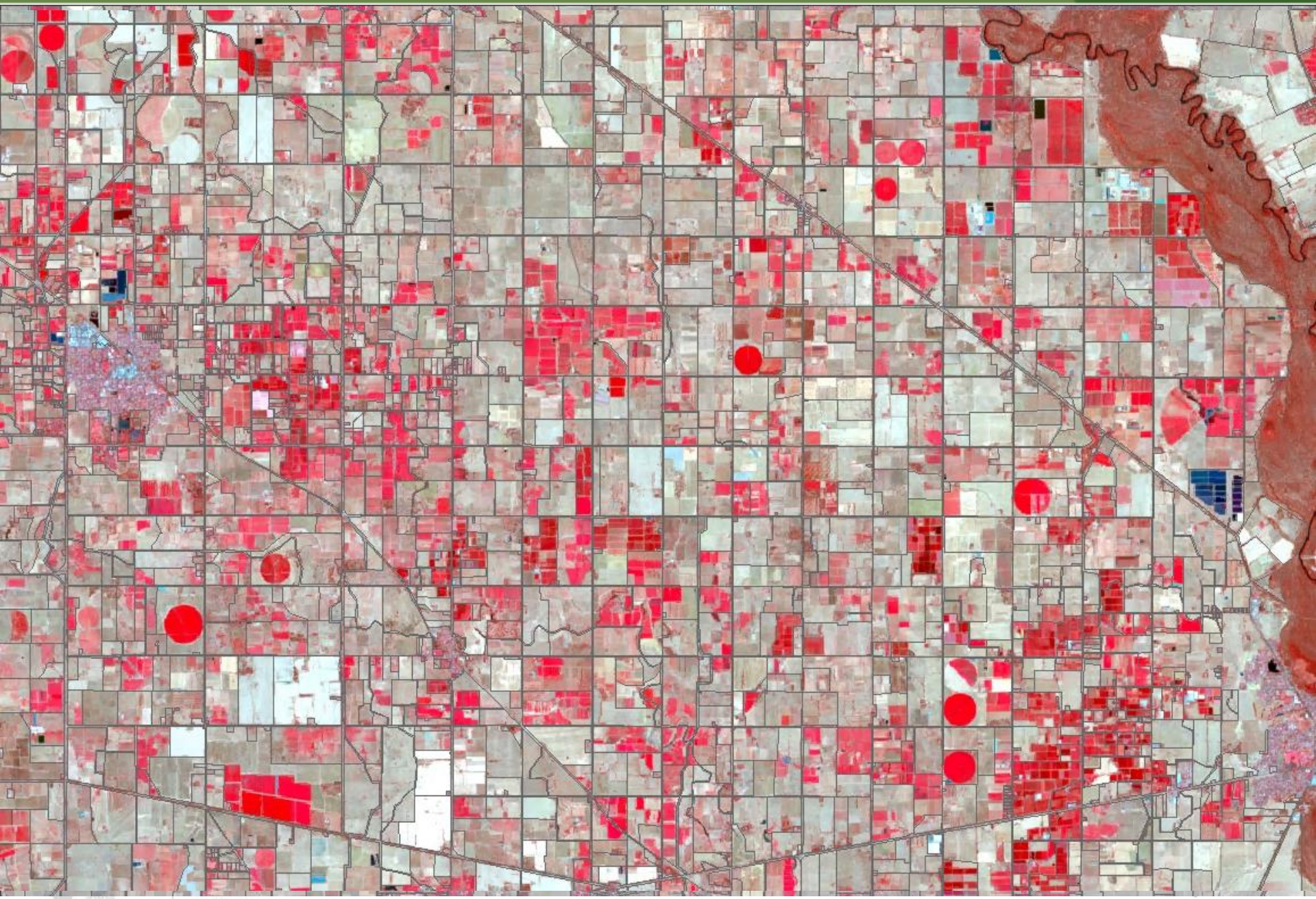
Dairy Seasonal Change



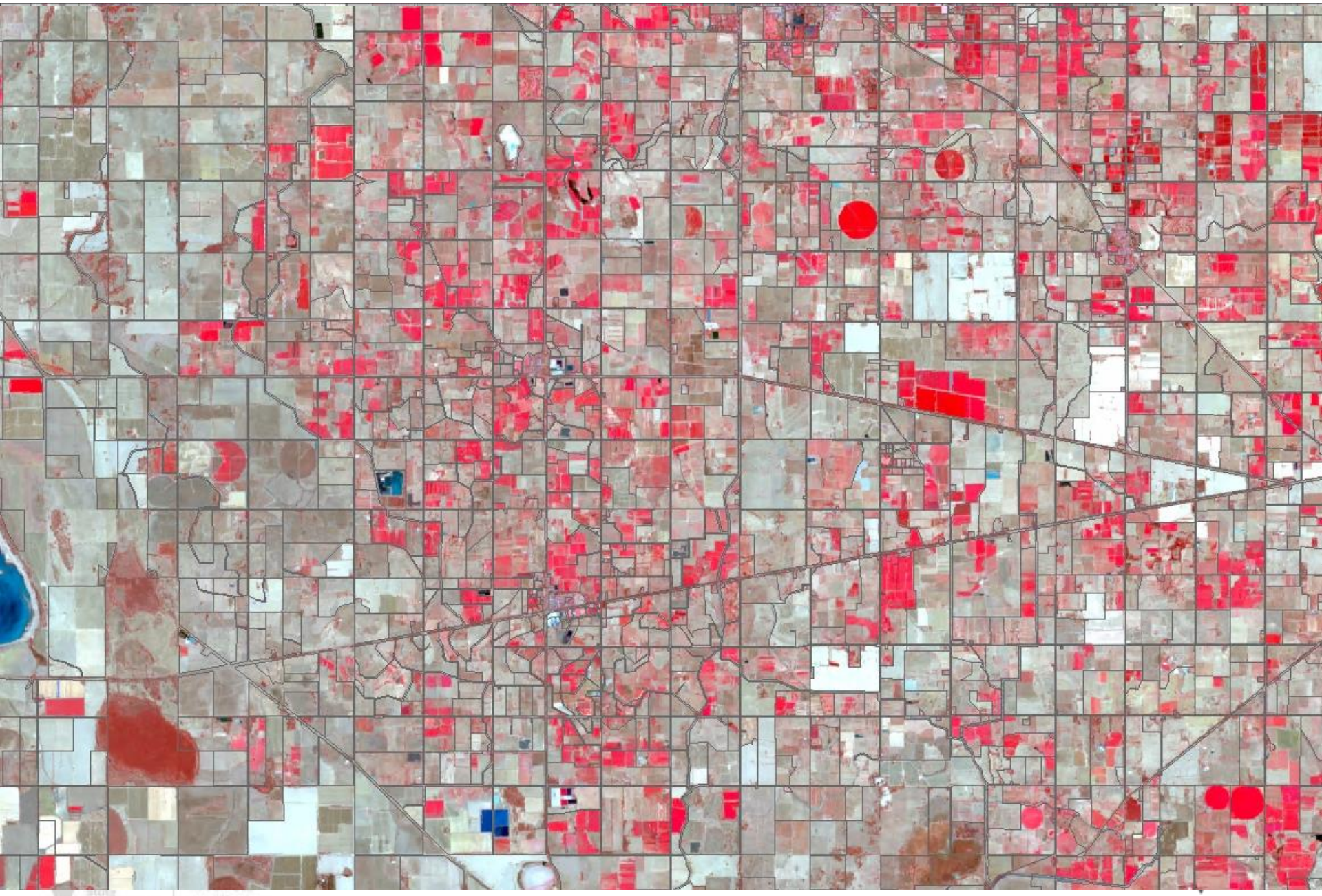
Central Goulburn – irrigation activity (17/18 – 18/19)



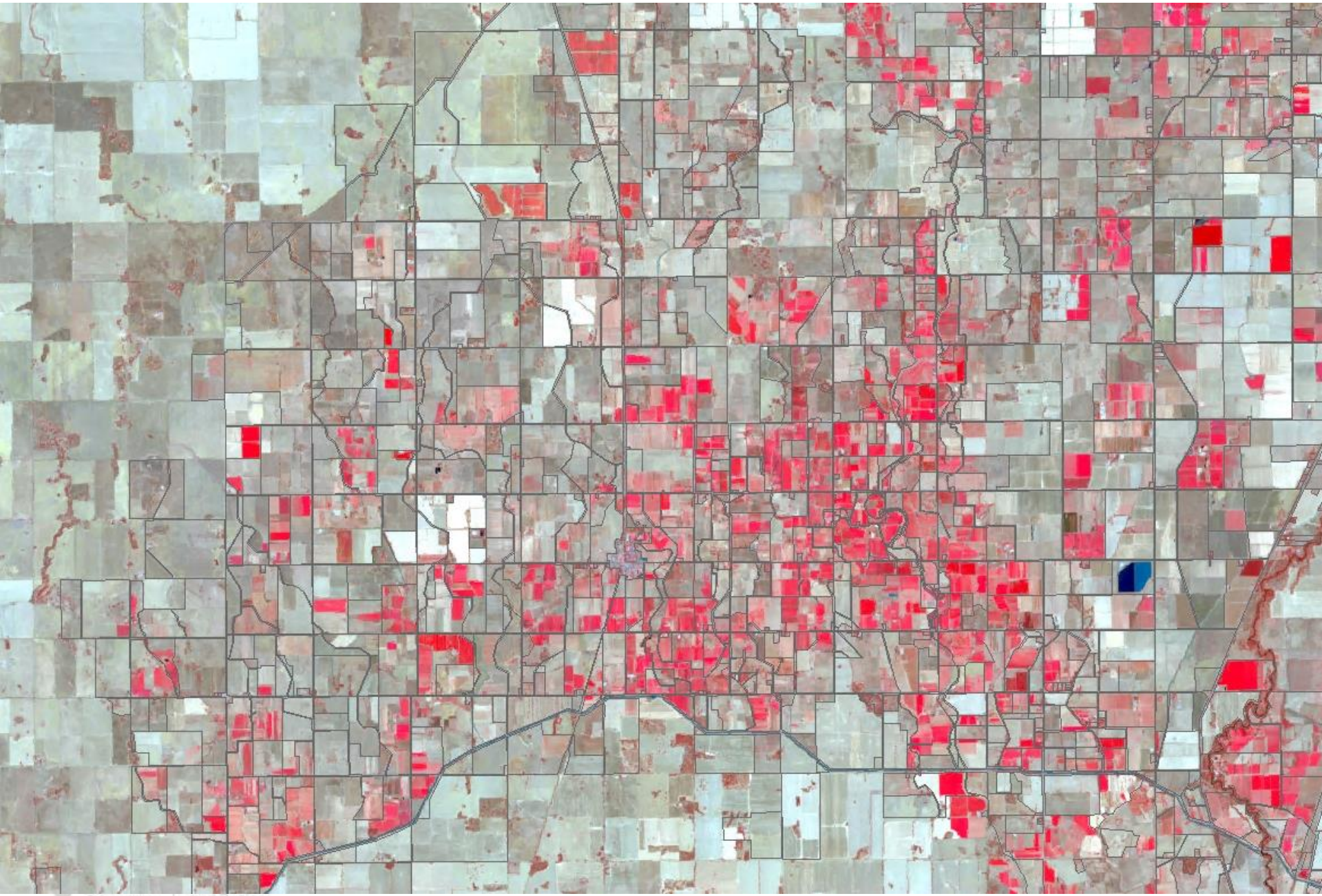




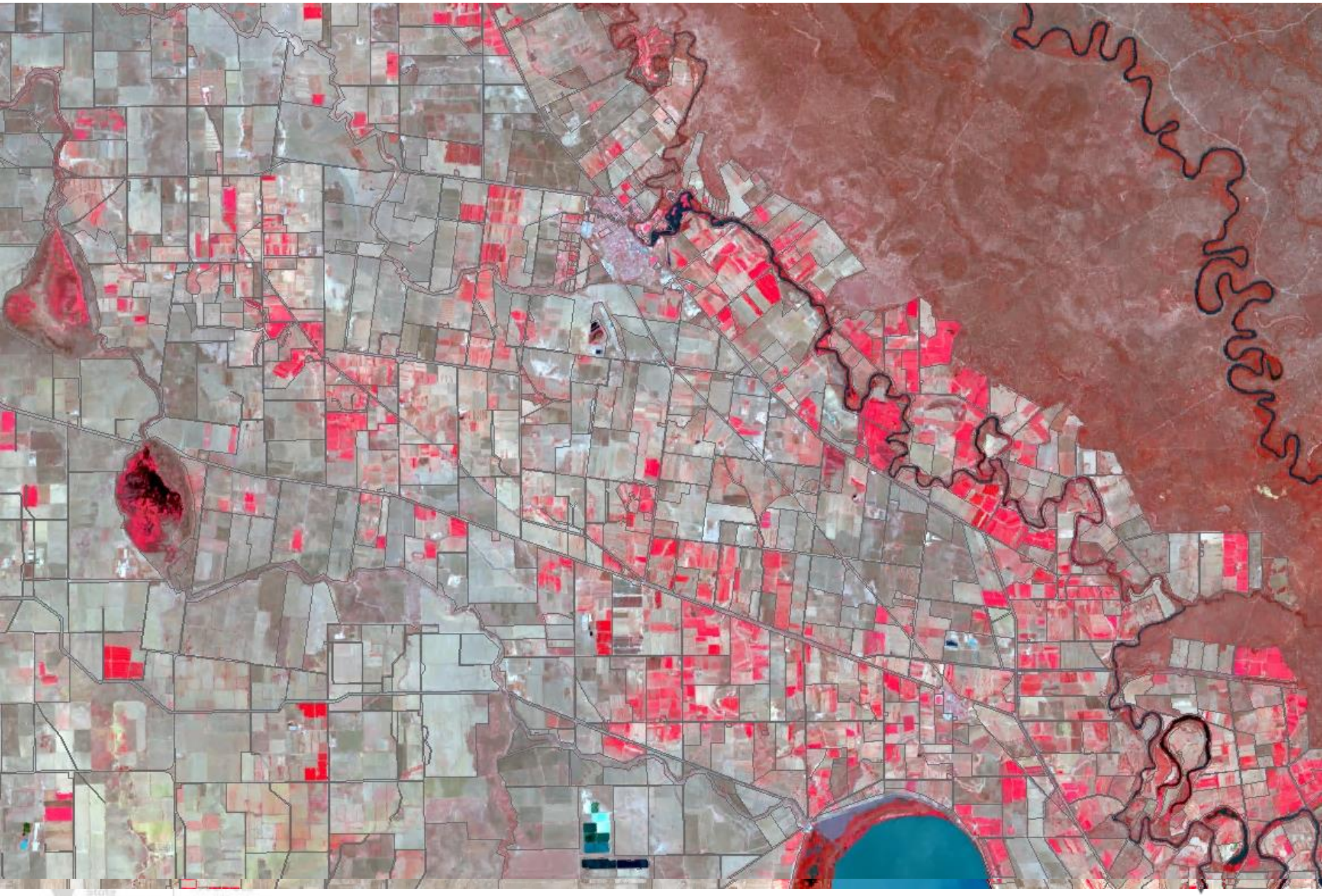
2019 to 2021 Summer Irrigation Change – Kyabram/Mooroopna



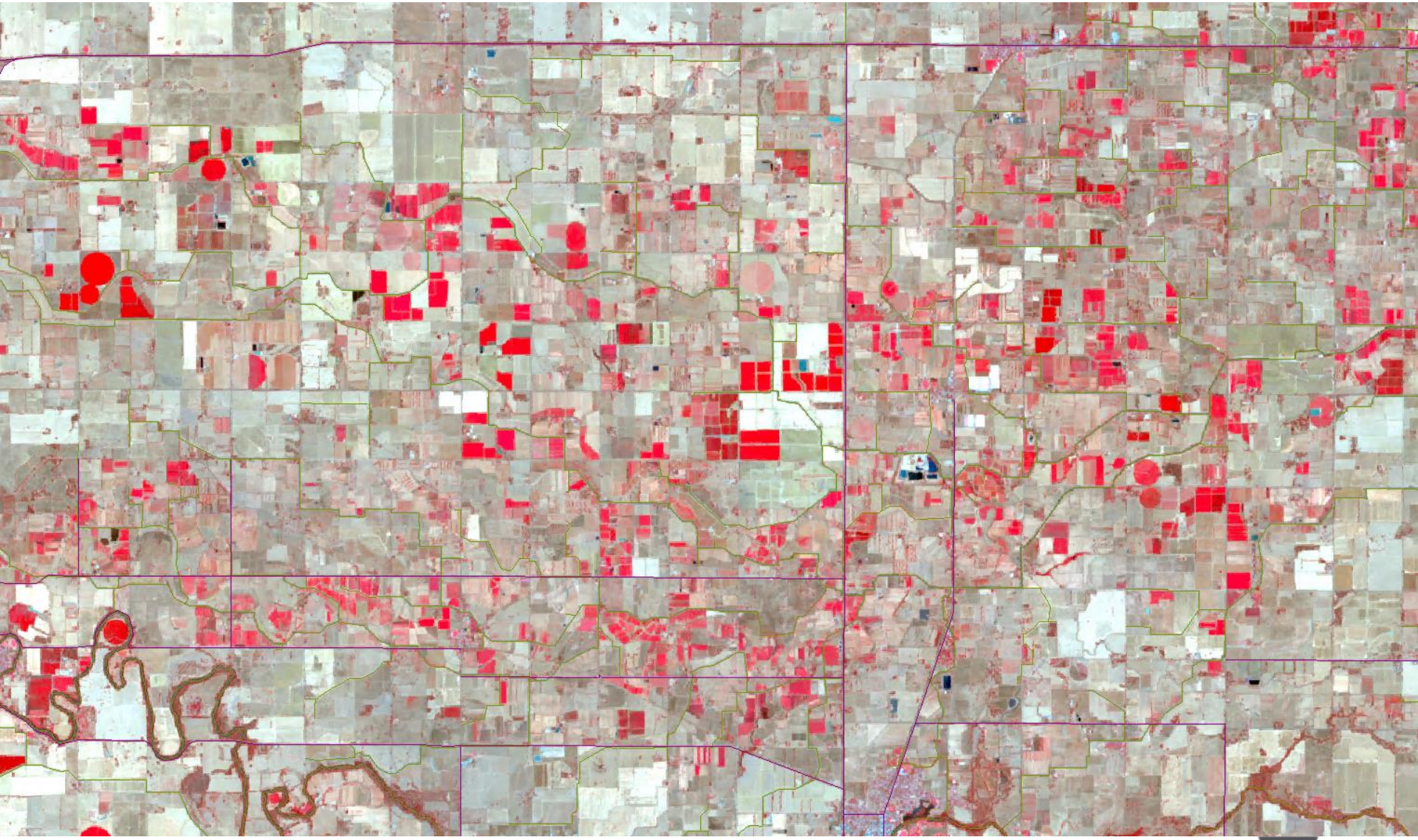
2019 to 2021 Summer Irrigation Change – Girgarre/Stanhope



2019 to 2021 Summer Irrigation Change – Lockington



2019 to 2021 Summer Irrigation Change – Cohuna



2019 to 2021 Summer Irrigation Change – Murray Valley

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Conclusions

- Continued reduction in no of dairy farms and restructuring in size
- In the traditional areas (CG/MV/RO/TO) still a significant number of medium to small properties
- Significant impact on water use 2018/19 – 2019/20 but variable.
- A move away from summer irrigation by the dairy industry with 398 water use licenses out of 781 irrigating in summer in 2019/20 but indication of return in 20/21.