Lessons Learned: The ABS Land Accounting Experience

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This session…

WAVES

- Brief background on Australian Land Accounting
- ABS Land account construction – links with Ecosystem Accounting
- Producing consistent time series – selecting the most appropriate data and methods of integration
- Harmonisation with System of National Accounts
- Modelling land value

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Australian Land Accounts

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- ABS have produced 4 Land Accounts
  - All titled 'Experimental'
  - We haven't let data currency or quality issues stop us producing them
- Methods have changed slightly for each account
  - Our latest change account covered the same region as the original account
  - We applied the latest methods to the older data, essentially revising the first account

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How is a Land Account Prepared?

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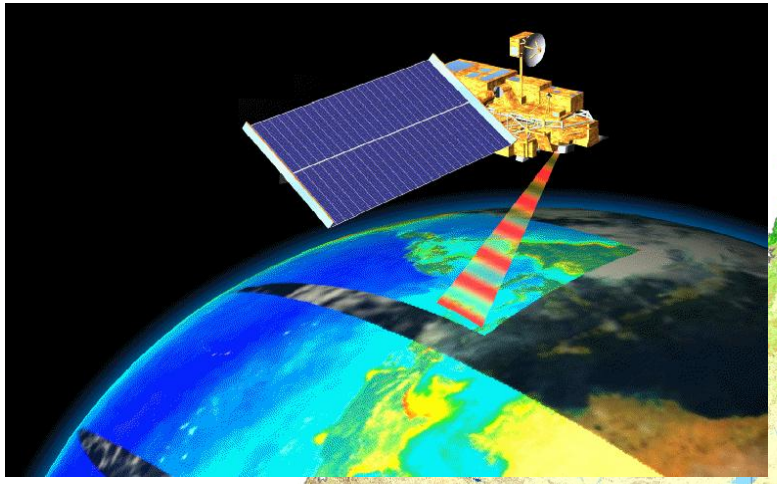
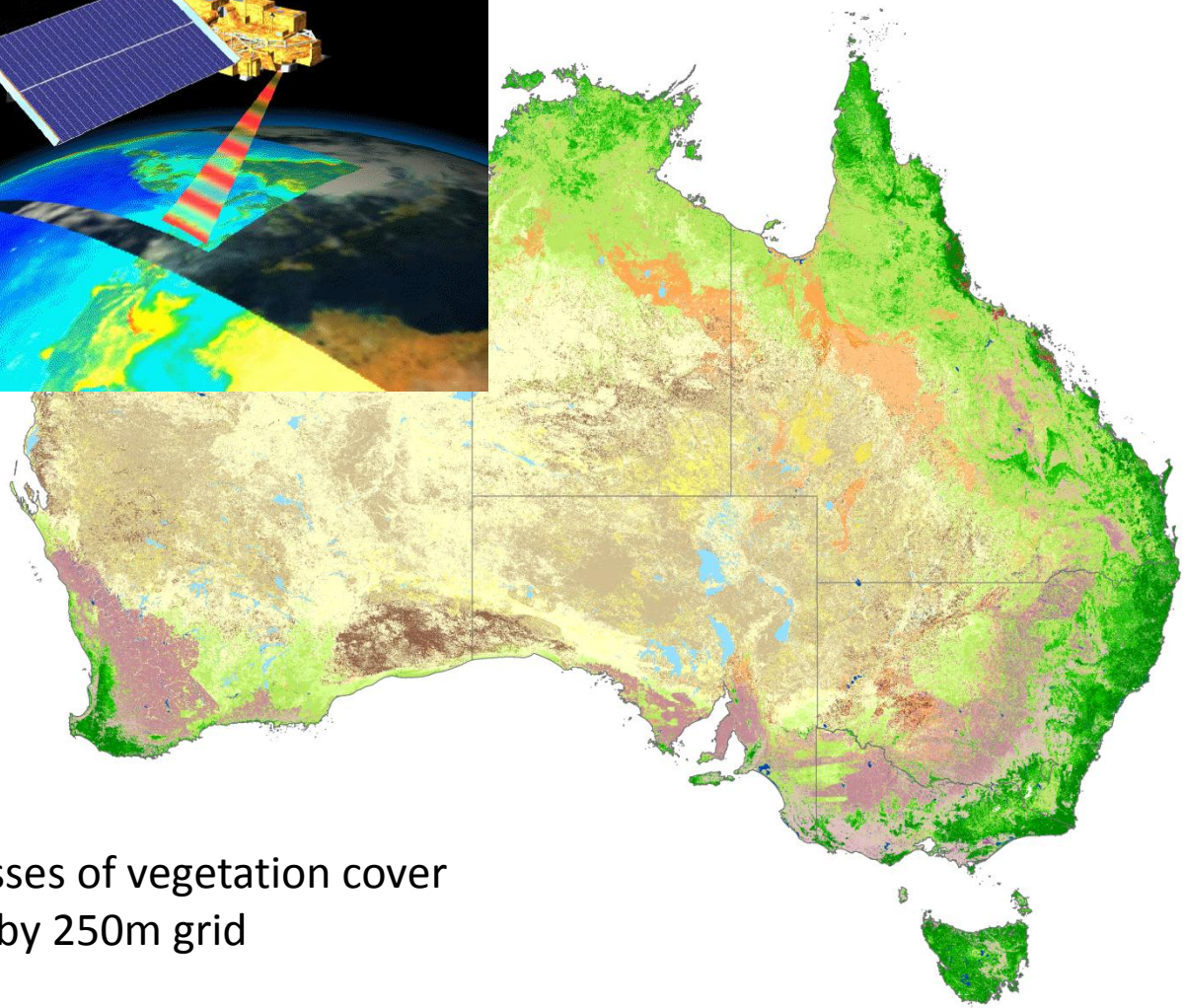
Australian Land Cover





- 34 classes of vegetation cover
- 250m by 250m grid

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How is a Land Account Prepared?

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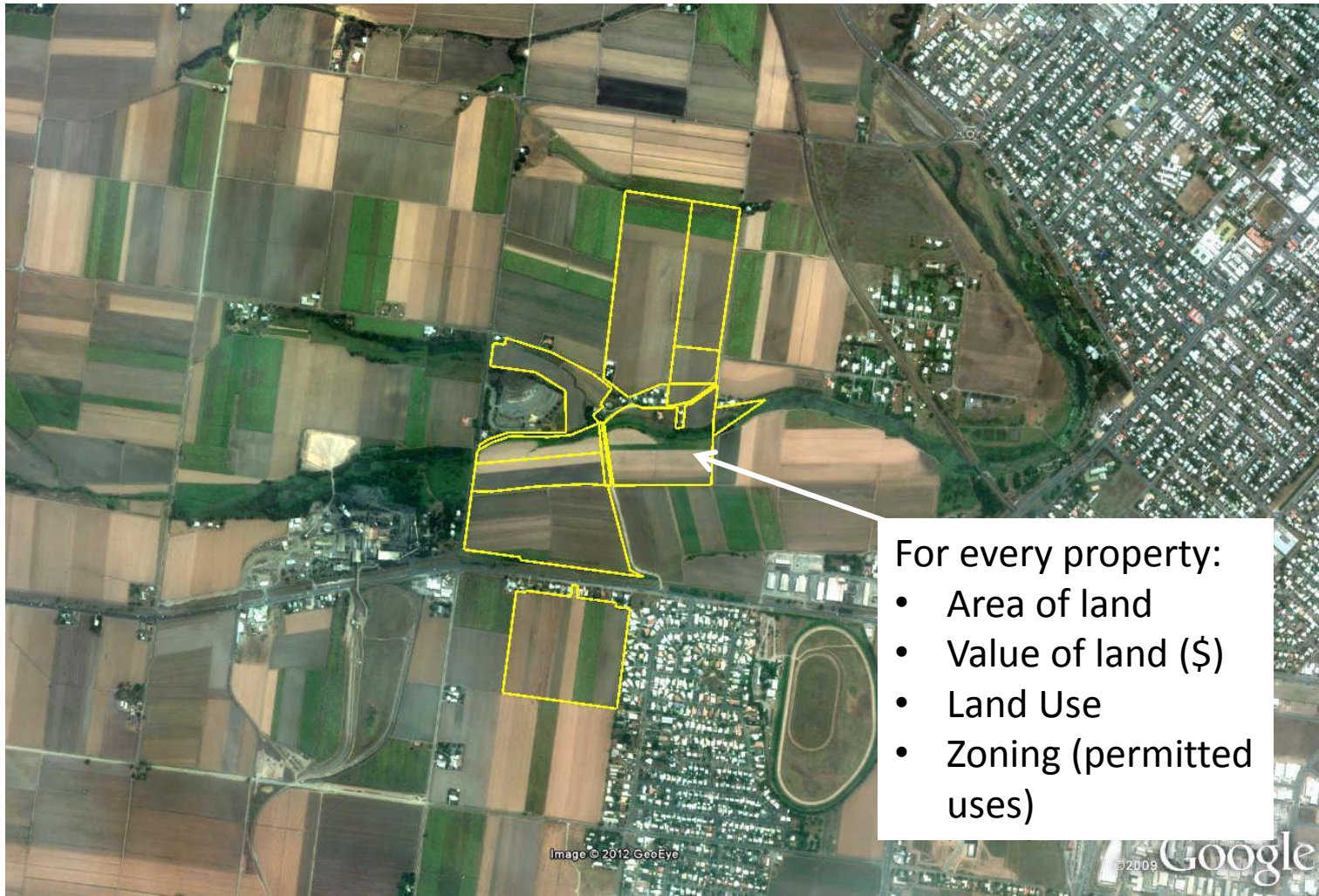
State Valuer General land titles data

- Maintained and updated by Local Governments



For every property:

- Area of land
- Value of land ($)
- Land Use
- Zoning (permitted uses)

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How is a Land Account Prepared?

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Australian Business Register

- Maintained and updated by the Australian Taxation Office and the Australian Bureau of Statistics

For every business:

- Industry (main activity)
- Sector of the economy
- Number of employees

How is a Land Account Prepared?

Data is combined using GIS software

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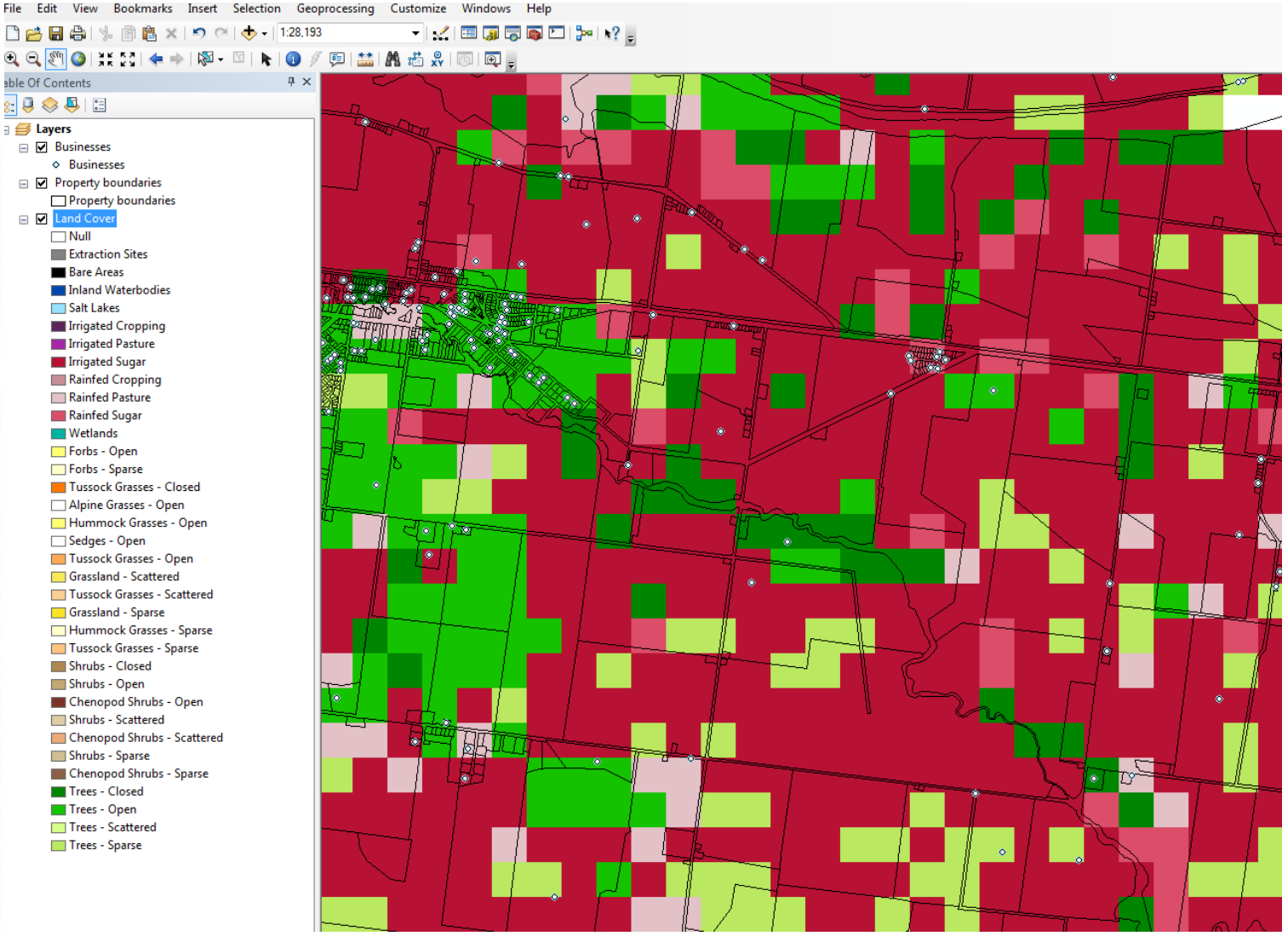

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Producing consistent time series

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- Land cover data in a common grid format and common process for it's creation across time periods
  - Data produced by a single agency
  - Processes applied to create a time series in a single project
- Conversion to a suitable projection for area calculation based on agreed method

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Producing consistent time series

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- Geoscience Australia (NAMRIA equivalent) have produced a “data cube” and Landsat imagery
- Provides a model infrastructure for time series analysis
  - Consistent method, resolution and alignment for 15 years of data
- A good example to share with NAMRIA

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Producing consistent time series

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Land Use:

- Choosing data sources – finest resolution is not always the best
- Many other sources of land use information available
  - Building and maintaining your own land use layer for Australia is a BIG task
- Catchment Scale Land Use Mapping (50m) vs State Government Valuations land use for Cadastre
- Consider long-term goals of accounts

Producing consistent time series

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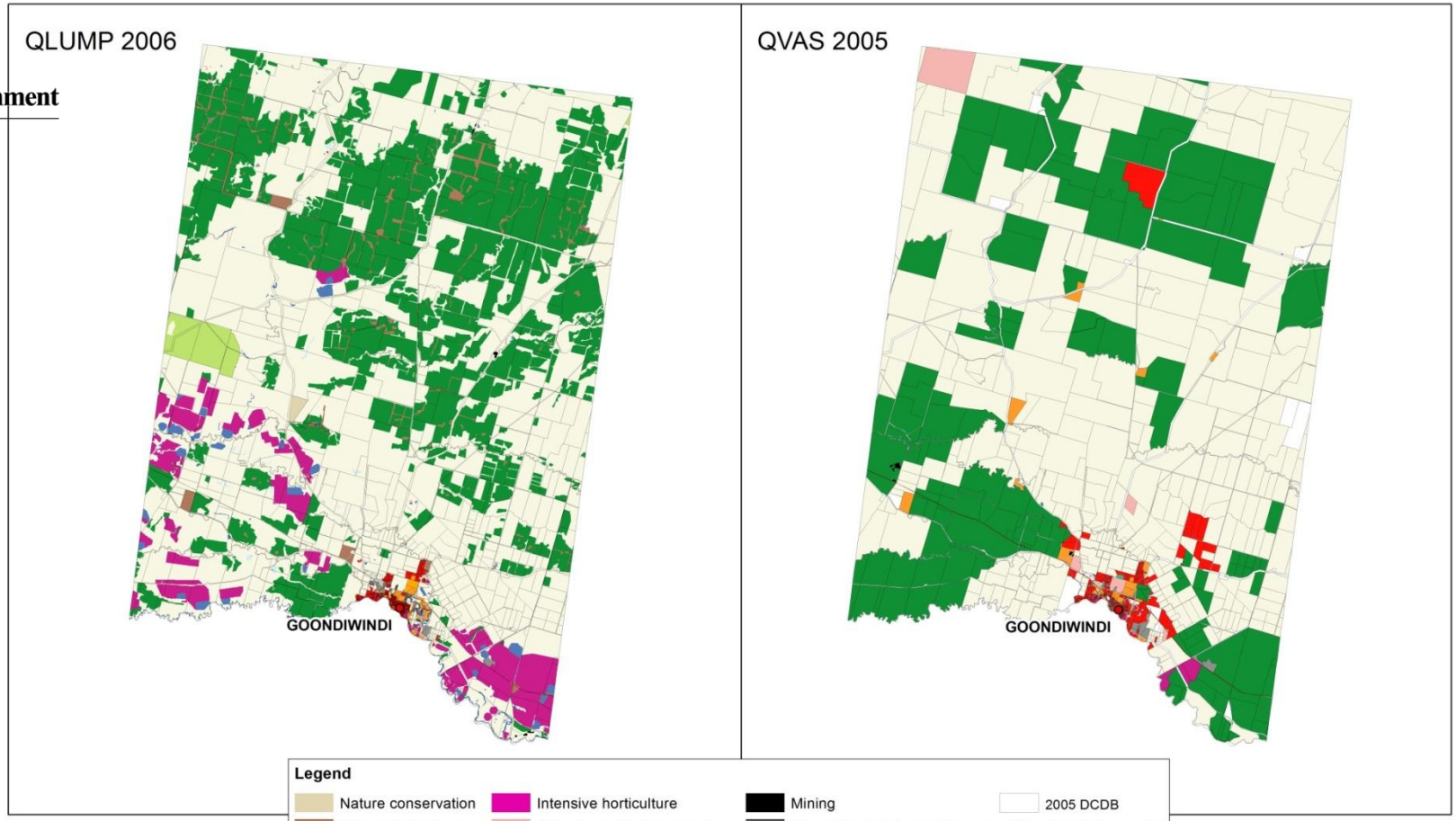

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Producing consistent time series

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- Carefully consider the number of different input datasets to an account
- The more variables that go into a dataset, the more chance one of them will introduce ‘synthetic’ change in a time series
- Understanding what is causing change in time series data is a challenge!

Example of how time-series data can shed light on an issue

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Land area net change matrix entire GBR region

Extractive Industry and Infrastructure/Utilities

- Area grew by 29% from 390,000ha to 506,000ha

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4609055001DO004_201306 Land Account: Great Barrier Reef Region, Experimental Estimates, 2014

Released at 11:30 am (Canberra time) Fri 18 July 2014

Table 4.6 : Land use net change matrix 2009 to 2013, GBR Region Total (Hectares), 2014

Livestock Grazing

	Land use (Hectares)													
Land use	Opening Stock 2009	Residential	Commercial	Industrial	Extractive Industry and Infrastructure/Utilities	Agriculture Cropping	Livestock Grazing	Other Primary Production	Community Services, Sport, Heritage and Culture	National Parks, conservation areas, forest reserves and natural water	Unallocated (a)	Not Classified (b)	Total Net Change	Closing Stock 2013
Residential	63,400	0	0	300	0	1,300	3,400	100	0	0	3,100	100	8,200	71,500
Commercial	39,900	0	0	0	4,200	-200	-3,800		-100	-200	100		500	40,500
Industrial	48,500	-300	0	0	-4,500	1,800	-1,300	-100	-200	0	400	-300	-4,500	44,000
Extractive Industry and Infrastructure/Utilities	390,900	0	-4,200	4,500	0		78,400	-100		7,200	12,900	-7,400	115,100	506,000
Agriculture Cropping	1,[illegible]	-1,300	200	-1,800		0	[illegible]	-11,200		-700	-6,700	-71,200	[illegible]	1,811,200
Livestock Grazing	29,590,100	-3,400	3,800	1,300	-78,400	25,200	0	25,700			131,100	331,300	428,700	30,018,800
Other Primary Production	458,200	-100		100	100	11,200	-25,700	0		22,600	-4,500	12,100	-8,200	449,900
Community Services, Sport, Heritage and		0	100	200				0	0	5,400	200			69,600
National Parks, conservation areas, forest reserves and natural water		0	200	0	-7,200			-22,600	-5,400	0	-37,200			154,600
Unallocated (a)	2,353,300	-3,100	-100	-400	-12,900	6,700	-131,100	4,500	-200	37,200	0	23,800	-75,700	2,277,700
Not Classified (b)	2,343,600	-100	-600	300	7,400	71,200	-331,300	12,100	0	-14,100	-23,800	0	-279,000	2,064,600

390,000

78,400

115,100

(a) This includes land uses that could not be allocated to AVPCC.
(b) No land use information available.
Note: Sums may not necessarily equal totals due to rounding. All values have been rounded to the nearest hundred (hectares).

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Monetary Account for land use entire GBR region

Extractive Industry and Infrastructure/Utilities

- Rateable value decreased by 20%, predominantly driven by a negative revaluation of $98 million.

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4609055001DO001_201306 Land Account: Great Barrier Reef Region, Experimental Estimates, 2014

Released at 11:30 am (Canberra time) Fri 18 July 2014

Table 1.6 : Monetary account for land use 2009 to 2013, GBR Region Total (Rateable value), 2014

423,578

-98,052

	Land use $'000											
	Residential	Commercial	Industrial	Extractive Industry and Infrastructure/Utilities	Agriculture Cropping	Livestock Grazing	Other Primary Production	Community Services, Sport, Heritage and Culture	National Parks, conservation areas, forest reserves and natural water (b)	Unallocated (c)	Not Classified (b)	Total
Opening stock 2009	68,816,068	5,757,879	2,712,613	423,578	2,287,552	8,033,850	322,219	548,424	0	19,903,770	0	108,805,953
Additions to stock												
Acquisitions of land (a)	0	0	0	0	0	0	0	0	0	0	0	0
Reclassifications (a)	0	0	0	0	0	0	0	0	0	0	0	0
Total additions to stock	2,619,616	253,908	197,349	55,438	88,790	168,422	47,408	51,905	28,251	687,333	1,244,256	5,442,676
Reductions in stock												
Disposals of land (a)	0	0	0	0	0	0	0	0	0	0	0	0
Reclassifications (a)	0	0	0	0	0	0	0	0	0	0	0	0
Total reductions in stock	-974,085	-311,874	-153,799	-41,169	-221,708	-364,285	-38,839	-26,912	0	-3,310,005	0	-5,442,676
Revaluations	12,269,780	-995,519	120,316	-98,052	538,463	-142,180	166,934	-92,912	-28,251	4,342,245	-1,244,256	14,836,567
Closing stock 2013	82,731,379	4,704,393	2,876,479	[illegible]	2,693,097	7,695,807	497,722	480,505	0	21,623,343	0	123,642,521

(a) These classes have not been populated due to lack of data on the reasons for change. The headings have been included to show the aspiration of a monetary account table.
(b) National Parks, conservation areas, forest reserves and natural water and Not Classified are non-valued land use types.
(c) This includes land uses that could not be allocated to AVPCC.
Note: Sums may not necessarily equal totals due to rounding. All values have been rounded to the nearest hundred (dollars).

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Issues for consideration

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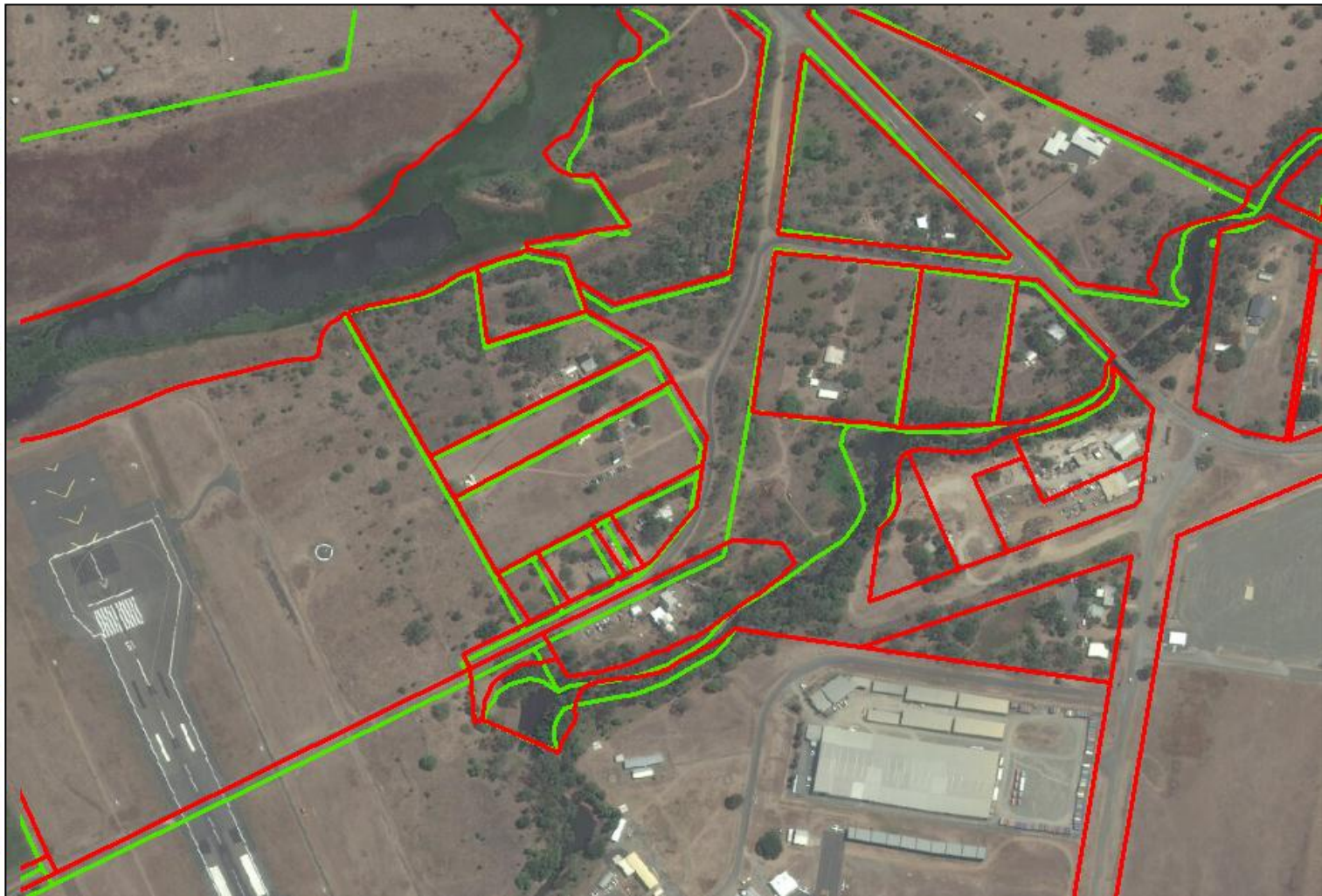
Example of the shifted Cadastre between 2009 and 2013



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Issues for consideration

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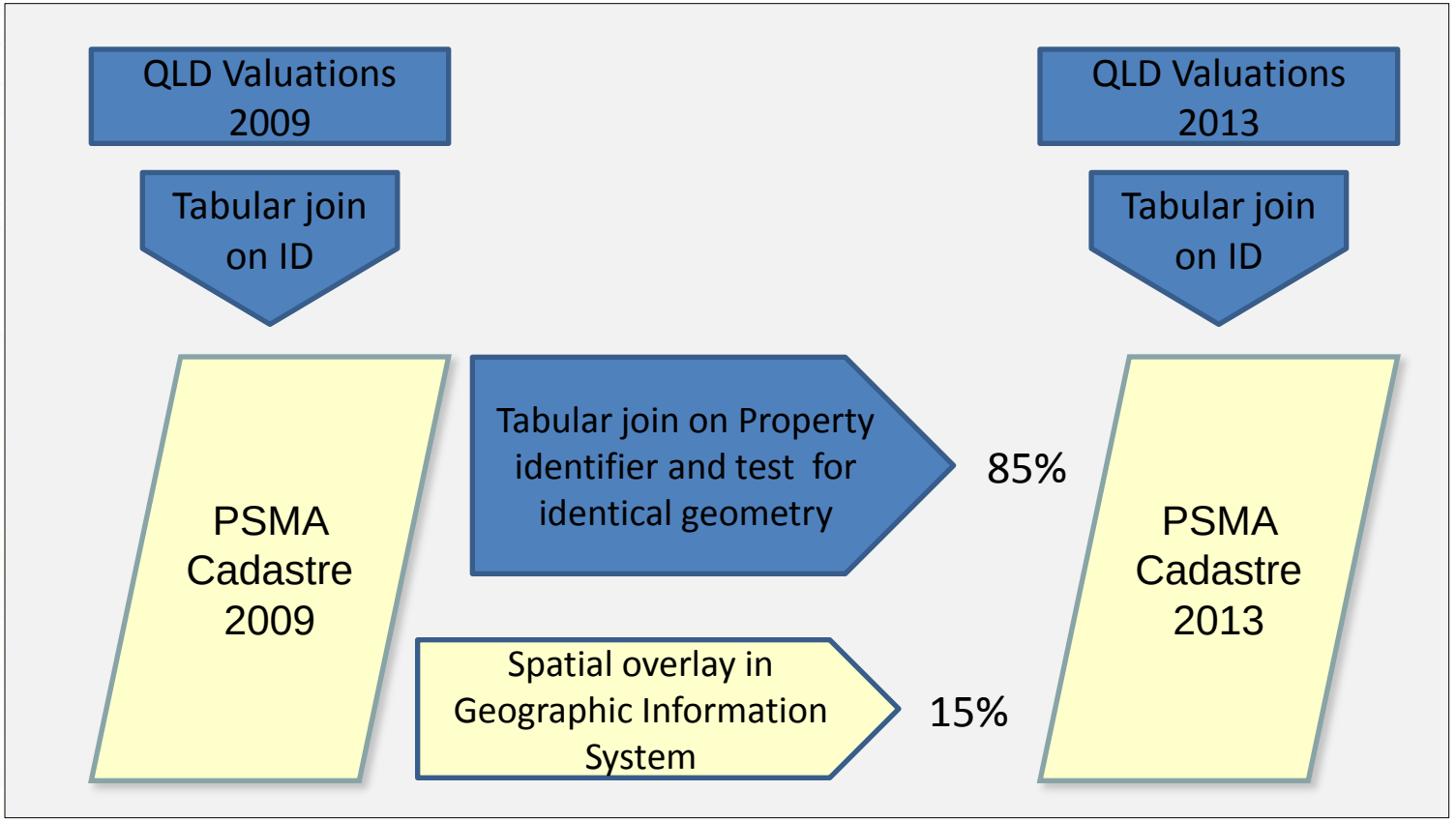
How was the data used? (The simplified version)



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Choosing classifications to report on

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- Aggregating classes is easier than disaggregating them
- ABS chose to use the Victorian State land use classification for this reason
  - Other States are aggregated to this
  - Keeping these aggregations consistent is important over time
- Reporting on many classifications in a single table may be confusing

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Maintaining consistency with System of National Accounts

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- Land values are harmonised between ABS System of National Accounts and Land Accounts

- This is achieved by simple weighting of the Land Account data to SNA for the relevant period

- Some of the data sources are common between the two accounts but some differ

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Decomposing Land Values

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- The ABS Analytical Services section undertook an analysis using hedonic modelling of land value.
- Variables considered include:
  - Land cover
  - Rainfall
  - Temperature
  - Proximity to urban centres
  - Socio economic classification

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Services – What can land accounting tell us?

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- Carbon storage by land cover type and change – Olsen, etc
- Cultural services by land use – Parkland among built-up areas, National Parks.
- Land use indicator

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Summary

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- Land accounting a springboard to ecosystem accounting.
- Maintaining consistency in data and methods very important – but don't let it stop you!
- Choosing the most appropriate output geography is important – consider the users.

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Questions?

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Acknowledgements

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- This and other contributions are made possible by funding from Australian Aid (AusAID) and the World Bank.
- The Australian Bureau of Statistics and AusAID are pleased to be partners in the WAVES program, and in particular assisting with the implementation of the SEEA in the Asia-Pacific.

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Data formats

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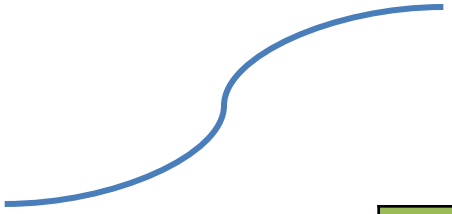
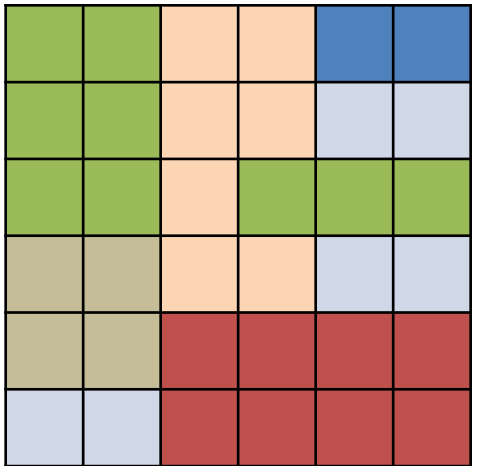
Point (eg: address)

22 Fifth Street

Polygon or vector (eg: Catchment)



Line (eg: stream)



Grid (eg: land cover data)