Publication details

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LAND USE OF AUSTRALIA 2010–11 TO 2015–16, 250 M

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NLUM_250m

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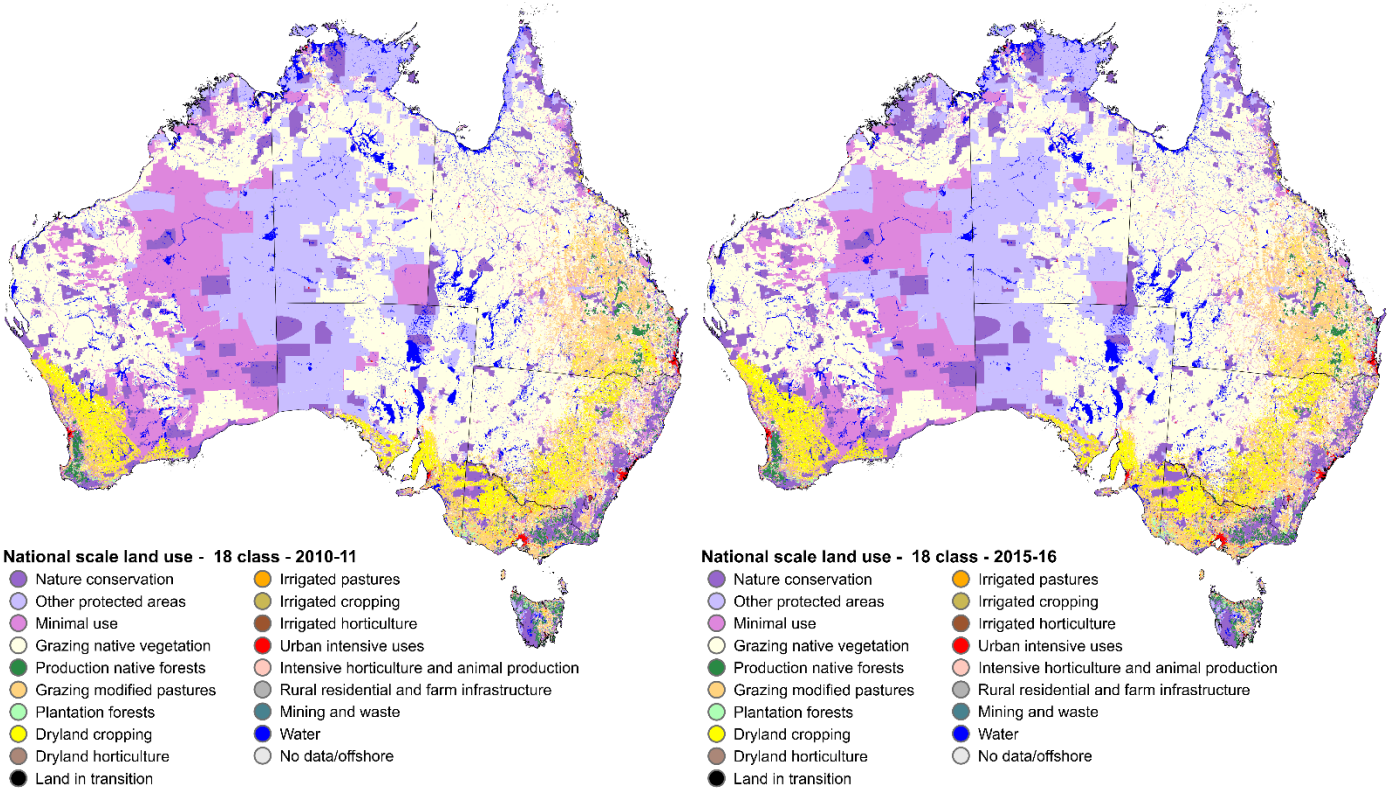
Preview:



Abstract:

The *Land use of Australia 2010–11 to 2015–16* is a data package of seamless continental rasters that present land use at national-scale for 2010–11, 2015–16 and the associated change between the two target periods. Non-agricultural land uses are mapped using 7 thematic layers, derived from existing datasets provided by state and territory jurisdictions and external agencies. These 7 layers are: protected areas, topographic features, land tenure, forest type, catchment-scale land use, urban boundaries, and stock routes. The agricultural land uses are based on the Australian Bureau of Statistics' 2010–11 and 2015–16 agricultural census data; with spatial distributions modelled using Terra Moderate Resolution Imaging Spectroradiometer (MODIS) satellite imagery and training data, assisted by spatial constraint layers for cultivation, horticulture, and irrigation.

Land use is specified according to the Australian Land Use and Management (ALUM) Classification version 8. The same method is applied to both target periods using representative national datasets for each period, where available. All rasters are in GeoTIFF format with geographic coordinates in Geocentric Datum of Australian 1994 (GDA94) and a 0.002197 degree cell size.

The *Land use of Australia 2010–11 to 2015–16* data package is a product of the Australian Collaborative Land Use and Management Program.

Descriptive information

Authors:
Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)

Acknowledgements:
This data package was produced by Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) within the Australian Government Department of Agriculture, Water and the Environment as part of the Australian Collaborative Land Use and Management Program (ACLUMP). ACLUMP, of which ABARES is a partner, is a consortium of Australian Government, and state and territory government partners that promotes the development of nationally consistent land use, land cover and land management practice information for Australia. More information on ACLUMP is available at www.awe.gov.au/landuse.

Data were sourced from and used with permission of: the Australian Bureau of Statistics, Australian Government Department of Agriculture, Water and the Environment, Coleambally Irrigation Co-operative Limited, CSIRO, Department of Regional New South Wales, Department of Natural Resources and Environment Tasmania, Geosciences Australia, NASA, NSW Department of Planning, Industry and Environment, NT Department of Environment, Parks and Water Security, PSMA Australia Limited, Queensland Department of Environment and Science, Queensland Department of Resources, Victoria Department of Jobs, Precincts and Regions, SA Department of Environment, Water and Natural Resources, the United States Geological Survey, WA Department of Lands and Surveys and WA Department of Primary Industries and Regional Development.

Constraints

LEGAL CONSTRAINTS ASSOCIATED WITH THE MATERIAL

Limitation on the use of the material:
The Australian Government acting through the Department of Agriculture, Water and the Environment, represented by the Australian Bureau of Agricultural and Resource Economics and Sciences, has exercised due care and skill in preparing and compiling the information and data in this publication. Notwithstanding, the Department of Agriculture, Water and the Environment, ABARES, its employees and advisers disclaim all liability, including liability for negligence and for any loss, damage, injury, expense or cost incurred by any person as a result of accessing, using or relying on any of the information or data in this publication to the maximum extent permitted by law.

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Additional information about this material

Purpose for which the material was obtained:
These land use datasets provide a national scale spatial representation of how the Australian landscape was used for the specified 12-month period. Land use can be for food production, forestry, nature conservation, water storage or urban development. These datasets provide the location, extent and the ability to explore change in land use between 2010–11 and 2015–16. They are inputs to a national land account as part of a national approach to environmental economic accounting. Previous datasets have a coarser resolution of 0.01 degree cell size.

The Land use of Australia data series is recognised as Foundation Spatial Data by the Australia New Zealand Land Information Council and as an Essential Statistical Asset for Australia by the Australian Bureau of Statistics. Common applications of the datasets are in strategic planning and continental modelling.

How to use this data:

1. These datasets have been made for change analysis. With the nature of archived datasets, change may reflect improved data quality. When interpreting land use change, users should consider the input data sources and their influence on the final land use assigned to a cell (pixel).

2. Agricultural areas will not necessarily tally to those reported by the Australian Bureau of Statistics. Agricultural census data is scaled to fit the spatial extent for agricultural uses within Statistical Areas Level 2. This area is determined by subtracting the area occupied by non-agricultural land uses.

3. Agricultural land uses are informed by continuous probability surfaces for each commodity allocated. The rarest commodity is allocated first to cells with the highest probability for that commodity until its area is satisfied. Then the next rarest commodity is allocated to the remaining cells with the highest probability for that commodity until its area is satisfied. This continues until all land uses are allocated. The result approximates a maximum likelihood map.

4. Irrigated agricultural land uses are informed by an irrigation potential index and reflect those areas mostly likely to have been irrigated in the target period up to the area of the scaled irrigation statistics.

5. ACLUMP releases regular updates to its Catchment scale land use of Australia dataset. This provides more detailed land use mapping but as a compilation of various dates, between and often within jurisdictions, it is not recommended for reporting land use change nationally. The Queensland Land Use Mapping Program provides datasets for assessing land use change within its Natural Resource Management Regions.

6. The equal area projection (Australian Albers EPSG:3577) is provided for area calculations. The accuracy of the area estimates is affected by the cell size of the land use datasets and the input data sources used in their construction

Progress status of this material:
Final

Maintenance and update frequency:
Every five years

KEYWORD(S)

ANZLIC search words:
AGRICULTURE
AGRICULTURE Crops
AGRICULTURE Livestock
AGRICULTURE Horticulture
AGRICULTURE Irrigation
BOUNDARIES
BOUNDARIES Administrative
BOUNDARIES Biophysical
BOUNDARIES Cultural
FLORA
FLORA Exotic
FLORA Native
FORESTS
FORESTS Agriforestry
FORESTS Natural
FORESTS Plantation
HERITAGE
HERITAGE World

HUMAN ENVIRONMENT
LAND
LAND Conservation
LAND Conservation Reserve
LAND Topography
LAND Use
VEGETATION
VEGETATION Structural
WATER
WATER Lakes
WATER Surface
WATER Wetlands

General keywords:

Land use
Australian Collaborative Land Use and Management Program (ACLUMP)

TOPICS

ABARES topic categories:

Agriculture
Land Use
Environment and Natural Resource Management
Models, Risk, Spatial Data and Datasets

ISO topic categories:

Farming
Environment
Society
InlandWaters

SPATIAL EXTENT(S)

Description of spatial extent:

Australian Land

Spatial bounding box included in:

North: -1047686.3053171562496573 m ; South: -4964936.3053171560168266 m
East: 2468707.7485073595307767 m ; West: -2189542.2514926404692233 m
Equivalent geographic coordinates:
North: -9.995 degrees; South: -44.004 degrees; East: 154.004 degrees; West: 112.505 degrees.

Spatial area included in:

Australian Mainland. Australia excluding external territories.

Projection:

The datasets are available in geographic EPSG:4283 and equal area EPSG:3577 projections.

Coordinate reference details in Well-Known Text for geographic projection EPSG:4283:

```
GEOGCS["GDA94",
  DATUM["Geocentric_Datum_of_Australia_1994",
    SPHEROID["GRS 1980",6378137,298.257222101,
      AUTHORITY["EPSG","7019"]],
    TOWGS84[0,0,0,0,0,0,0],
    AUTHORITY["EPSG","6283"]],
  PRIMEM["Greenwich",0,
    AUTHORITY["EPSG","8901"]],
  UNIT["degree",0.0174532925199433,
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AUTHORITY["EPSG","9122"]],
AUTHORITY["EPSG","4283"]]

Coordinate reference details in Well-Known Text for equal area projection EPSG:3577:

PROJCS["GDA94 / Australian Albers",
GEOGCS["GDA94",
DATUM["Geocentric_Datum_of_Australia_1994",
SPHEROID["GRS 1980",6378137,298.257222101,
AUTHORITY["EPSG","7019"]],
TOWGS84[0,0,0,0,0,0,0],
AUTHORITY["EPSG","6283"]],PRIMEM["Greenwich",0,
AUTHORITY["EPSG","8901"]],
UNIT["degree",0.0174532925199433,
AUTHORITY["EPSG","9122"]],
AUTHORITY["EPSG","4283"]],
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PARAMETER["standard_parallel_2",-36],
PARAMETER["latitude_of_center",0],
PARAMETER["longitude_of_center",132],
PARAMETER["false_easting",0],PARAMETER["false_northing",0],
UNIT["metre",1,
AUTHORITY["EPSG","9001"]],
AXIS["Easting",EAST],
AXIS["Northing",NORTH],
AUTHORITY["EPSG","3577"]]

DATA PACKAGE CONTENTS

Table 1 Description of the Land use of Australia 2010–11 to 2015–16, 250 m data package

File name	File description
NLUM_ALUMV8_250m_20YY_YY_alb.zip	NLUM raster dataset with land uses described as primary, secondary, and tertiary classes of the ALUM classification version 8, plus the derived 18-class and agricultural industries summary classifications. One raster for each year. GeoTIFF, 16-bit integer. For attribute table description, see Table 2.
NLUM_CHANGE_250m_2010_11_to_2015_16_alb_18class.zip	NLUM observed change raster dataset providing 2010–11 land use, 2015–16 land use and observed land use change at 18-class summary classification. GeoTIFF, 16-bit integer. For attribute table description, see Table 3.
NLUM_INPUTS_250m_20YY_YY_geo.zip	NLUM raster dataset with the 7 input layers, agricultural commodities mapped and their irrigation status, and final land use class assigned according to ALUM v8. One raster for each year. GeoTIFF, 16-bit integer. For attribute table description, see Table 4.
AgProbabilitySurfaces_20YY_YY_geo.zip	Folder containing 23 continuous probability rasters for each year, 1 for each agricultural commodity mapping unit. Used to construct the maximum likelihood map for agricultural land uses. Values 0 to 10,000. GeoTIFF, 16-bit integer. See Table A2.8 for list.
Maps.zip	
• NLUM-PRIMV8_20YY_YY.png ; pdf	Map showing the NLUM dataset at ALUM primary classification; either 2010–11 or 2015–16.
• NLUM-SECV8_20YY_YY.png; pdf	Map showing the NLUM dataset at ALUM secondary classification; either 2010–11 or 2015–16.
• NLUM-CL18_20YY_YY.png; pdf	Map showing the NLUM dataset 18-class summary; either 2010–11 or 2015–16.
• NLUM-AGIND_20YY_YY.png; pdf	Map showing the NLUM dataset agricultural industries; either 2010–11 or 2015–16.
• NLUM-AGCOMMOD_20YY_YY.png; pdf	Map showing NLUM dataset classified by agricultural commodity; either 2010–11 or 2015–16.
• LUCH-CL18_2010_11_to_2015_16.png; pdf	Map showing where observed land use change occurred between 2010-11 and 2015-16 at the 18-class summary classification level.
Symbology.zip	Folder containing files to visualise rasters in ESRI ArcMap. The .clr files are ESRI colour map files and the .lyr files are ESRI raster symbology files.

Note: [projection] describes the projection of the raster. Rasters with the projection suffix 'alb' are in the coordinate system GDA94/Australian Albers (EPSG: 3577) with a 250 by 250 metres resolution. Rasters with a projection suffix 'geo' are in the coordinate system GDA94 (EPSG:4283) with a 0.02197 degree (degree equivalent of 250 metres) resolution. Each .tif raster dataset contains a .tif.aux.xml auxiliary file storing information including raster statistics, histogram, and attributes YY' denotes the year; '_11' for 2010–11 and '_16' for 2015–16.

DATA DICTIONARY

Table 2 Attributes of the NLUM raster datasets (NLUM_ALUMV8_250m_20YY_YY_alb.tif)

Field name	Field description	Code values
Value	ALUM code as a three-digit integer. First digit is primary code, second digit is secondary code, and third digit is tertiary code.	Integer numeric value. Range: 100 to 663
Count	Count of the number of raster cells in each class of Value	Integer count
TERTV8	ALUM tertiary code description as a string. Examples: 1.1.1 Strict nature reserves 6.6.3 Estuary/coastal waters - intensive use	Text
SECV8N	ALUM secondary code	Integer numeric value
SECV8	ALUM secondary code description as a string. See Table A1.2 for list.	Text
PRIMV8N	ALUM primary code	Integer numeric value
PRIMV8	ALUM primary code description as a string. See Table A1.1 for list.	Text
CL18N	Code for simplified 18-class land use classification based on ALUM.	Integer numeric value
CL18	Description of the simplified 18-class land use classification. See Table A1.3 for list.	Text
AGIND	Description of agricultural industries based on ALUM. See Table A1.4 for list.	Text

Note: All ALUM codes refer to the Australian Land Use and Management Classification, version 8.

Table 3 Data dictionary for the attributes of the NLUM Change 2010-11 to 2015-16 dataset (NLUM_CHANGE_250m_2010_11_to_2015_16_alb_18class.tif)

Field name	Field description	Data type
OID	A unique code automatically generated to start processing from index value zero.	Object ID
Value	Unique number given to each land use change combination.	Integer, range: 1 to 828
Count	Count of the number of raster cells with a given value in VALUE.	Integer count
CL18N_YY	Land use 18-class summary classification as an integer for the target period. '0' is No data/offshore.	Integer, range: 0 to 18
CL18_YY	Land use 18-class code description as a string for each target period. See Table A1.3 for list.	String, width 254
LUCH	Observed land use change code.	Integer, range: 0 to 2
LUCH_DESC	Description of observed land use change code. See Table A3.1 for list	String, width 254
LUCHN11_16	Change in land use 18-class code from the year 2010–11 to 2015–16.	String, width 150
LUCHD11_16	Change in land use 18-class description from the year 2010–11 to 2015–16.	String, width 150

Table 4. Data dictionary for the attributes of the NLUM Inputs raster datasets (NLUM_INPUTS_250m_20YY_YY_geo.tif)

Field name	Field description	Code values
Value	Unique number given to each combination of the values in the thematic input layers (protected areas, topographic features, tenure, forest type, catchment scale land use, urban boundaries stock routes and agricultural commodity mapping units)	Integer, range: 1 to 139,399 or 1 to 148,054
LUV8N	ALUM code as a three-digit integer. First digit is primary code, second digit is secondary code, and third digit is tertiary code.	Integer numeric value. Range: 100 to 663
Count	Count of the number of raster cells in each class of Value	Integer count

Field name	Field description	Code values
TERTV8	ALUM tertiary code description as a string. Examples: 1.1.1 Strict nature reserves 6.6.3 Estuary/coastal waters - intensive use	Text
SECV8	ALUM secondary code description as a string. See Table A1.2 for list.	Text
PRIMV8	ALUM primary code description as a string. See Table A1.1 for list.	Text
CL18N	Simplified 18-class land use classification	Integer numeric value. Range: 0 to 18
CL18	Description of the simplified 18-class land use classification. See Table A1.3 for list.	Text
PA	Protected area code.	Integer numeric value. Range: 11 to 70
PA_DESC	Description of the protected area code consisting of IUCN classification and description. See Table A2.1 for descriptions and meanings.	Text
TOPO	Topographic feature code	Integer numeric value. Range: 0 to 144
TOPO_DESC	Description of the topographic feature code. See Table A2.2 for descriptions and meanings.	Text
TEN	Land tenure code	Integer numeric value. Range: 0 to 2302
TEN_DESC	Description of tenure code. See Table A2.3 for descriptions and meanings	Text
FOR	Forest type code	Integer numeric value. Range: 0 to 9
FOR_DESC	Description of forest type code. See Table A2.4 for descriptions and meanings.	Text
CLUM	Catchment scale land use code as a three-digit integer for the ALUM code.	Integer numeric value. Range: 111 to 663
CLUM_DESC	Description of catchment scale land use ALUM tertiary code and description as a string.	Text
CLUM_CUR	The year of mapping (currency) of the CLUM dataset for the pixel.	Integer numeric value. Range 2003 to 2017 or 2018
URBAN	Urban boundaries code	Integer numeric value. Range: 0 to 3
URBAN_DESC	Description of urban constraint code. See Table A2.5 for descriptions and meanings.	Text
SR	Stock routes and minimal use code	Integer numeric value. Range: 1 to 7
SR_DESC	Description of stock routes and minimal use code. See Table A2.6 for descriptions and meaning.	Text
IRGN	Irrigation status code for agricultural commodity mapping unit	Integer numeric value 0 or 1.
IRGN_DESC	Description of irrigation status code	Text
AGMAPU	Agricultural commodity mapping unit code output from SPREAD II and mapping of grazing outside SPREAD II	Integer numeric value. Range: 0 to 25
AGMAPU_DESC	Description of agricultural commodity mapping unit codes. See Table A2.8 for descriptions.	Text
JURIS	Abbreviation of State or Territory jurisdiction	Text

Note: All ALUM codes refer to the Australian Land Use and Management Classification, version 8. IUCN is the International Union for the Conservation of Nature.

RESPONSIBILITY FOR THIS MATERIAL

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Process used to generate this material

LINEAGE STATEMENT

Lineage:

To determine the non-agricultural land uses, 7 thematic layers were constructed as rasters with 0.002197 degree resolution and overlaid according to an expert rule-based spatial analysis. Input data was provided by state and territory agencies and external entities. The themes and their main sources were:

I. Protected areas layer - Collaborative Australian Protected Areas database (Department of Agriculture, Water and the Environment 2012ab, 2016ab, 2018ab) and World Heritage Areas (Department of Agriculture, Water and the Environment 2012c, 2020)
II. Topographic features layer – GEODATA TOPO 250K series 3 (Geoscience Australia 2006), Surface Hydrology Polygons (National) (Geoscience Australia 2015), Water Observation from Space (Geoscience Australia 2018) and ABS Census Urban Centres and Localities data (Australian Bureau of Statistics 2011, 2016)
III. Land tenure layer – Land tenure of Australia 2010-11 to 2015-16, 250 m (ABARES 2021)
IV. Forest type layer – Forests of Australia (2013) v2.0 (ABARES 2016a) and Forests of Australia 2018 (ABARES 2018). Additionally, native forest areas with Multiple-use public forest tenure assessed as non-commercial or legally restricted from wood harvesting (Davey & Dunn 2014; Montreal Process Implementation Group for Australia and National Forest Inventory Steering Committee 2018) were excluded from allocation to Production native forests.
V. Catchment scale land use (CLUM) layer – a combination of available ACLUMP CLUM datasets most appropriate for each time period
VI. Urban boundaries layer – ABS Urban Centres and Localities dataset (Australian Bureau of Statistics 2016)

VII. Stock routes layer – PSMA Land Tenure February 2017, PSMA Land Tenure February 2012, Stock routes Queensland (Department of Natural Resources 2007), Conservation value of NSW travelling Stock Reserves (TSRs) (Department of Regional New South Wales 2017) and Stock routes in Western Australia (Department of Lands and Surveys 2019).

Tables A2.1–6 lists the attributes within each thematic layer excluding the CLUM layer attributes as these as described for ALUM v8 (ABARES 2016). The data sources and their currency used in the construction of these layers are provided in Table A4.1.

Data for the forest type layer was supplied as a 100 m resolution raster and was resampled to 0.002197 degree resolution (equivalent to 250 m). All other thematic inputs were rasterised to 0.002197 degree rasters in a two-step process replicating maximum combined area rasterisation. Polygons were rasterised to 0.0004394 degree (equivalent to 50 by 50 metres) rasters using cell point centre, then resampled by mode to 0.002197 degree resolution. This corresponded to a simple majority rasterization. For some thematic layers constructed from multiple datasets, datasets were combined as 0.0004394 degree rasters rather than vector files.

The extent of agricultural land use was based on the area of Australia excluding the non-agricultural land use. Agricultural land uses were allocated using the SPatial REallocation of Aggregated Data – version 2 (SPREAD II) algorithm (Knapp 2016). The spatial distribution of agricultural land uses on non-forested agricultural land were modelled using agricultural area estimates based on the 2010–11 and 2015–16 agricultural census data collected by the Australian Bureau of Statistics at the Australian Statistical Geography Standard (ASGS) Statistical Area Level 2 (SA2). Agricultural land uses were allocated using temporal normalised difference vegetation index (NDVI) profiles derived from Terra MODIS satellite imagery and ground referenced data. The NDVI profiles covered the growing period for each time period, from 1 April of the first year to 31 March of the second year. Nearly 32,000 ground reference points were collated from various ACLUMP partner state government agencies, Coleambally Irrigation Co-operative Limited and the United States Geological Survey. These data were collected for the period 2000–2017. SPREAD II was further constrained using spatial constraints for cultivation and horticulture. For construction of the cultivation constraint, a vegetation condition layer was generated using multiple state and national level datasets including the National Vegetation Information System, NSW native vegetation extent, WA current extent of native vegetation, Queensland remnant vegetation cover and CLUM. Non-native or modified vegetation areas were identified from these datasets with this layer informing the cultivation constraint. The horticulture spatial constraint was developed from ACLUMP catchment scale land use mapping.

In the first stage of running SPREAD II, native pasture and cultivation areas were separated using the cultivation spatial constraint. In the second stage, the horticulture spatial constraint was used to allocate horticulture and agronomic mapping units within the cultivation pixels obtained from the first run. Irrigation status of both agronomic and horticultural mapping units were implemented outside SPREAD II, assisted by an irrigation constraint developed from the catchment scale land use layer and a newly constructed irrigation potential index data created from Water Observations from Space (Geoscience Australia, 2018) and MODIS Land Surface Water Index (Fensholt and Sandholt 2003) datasets.

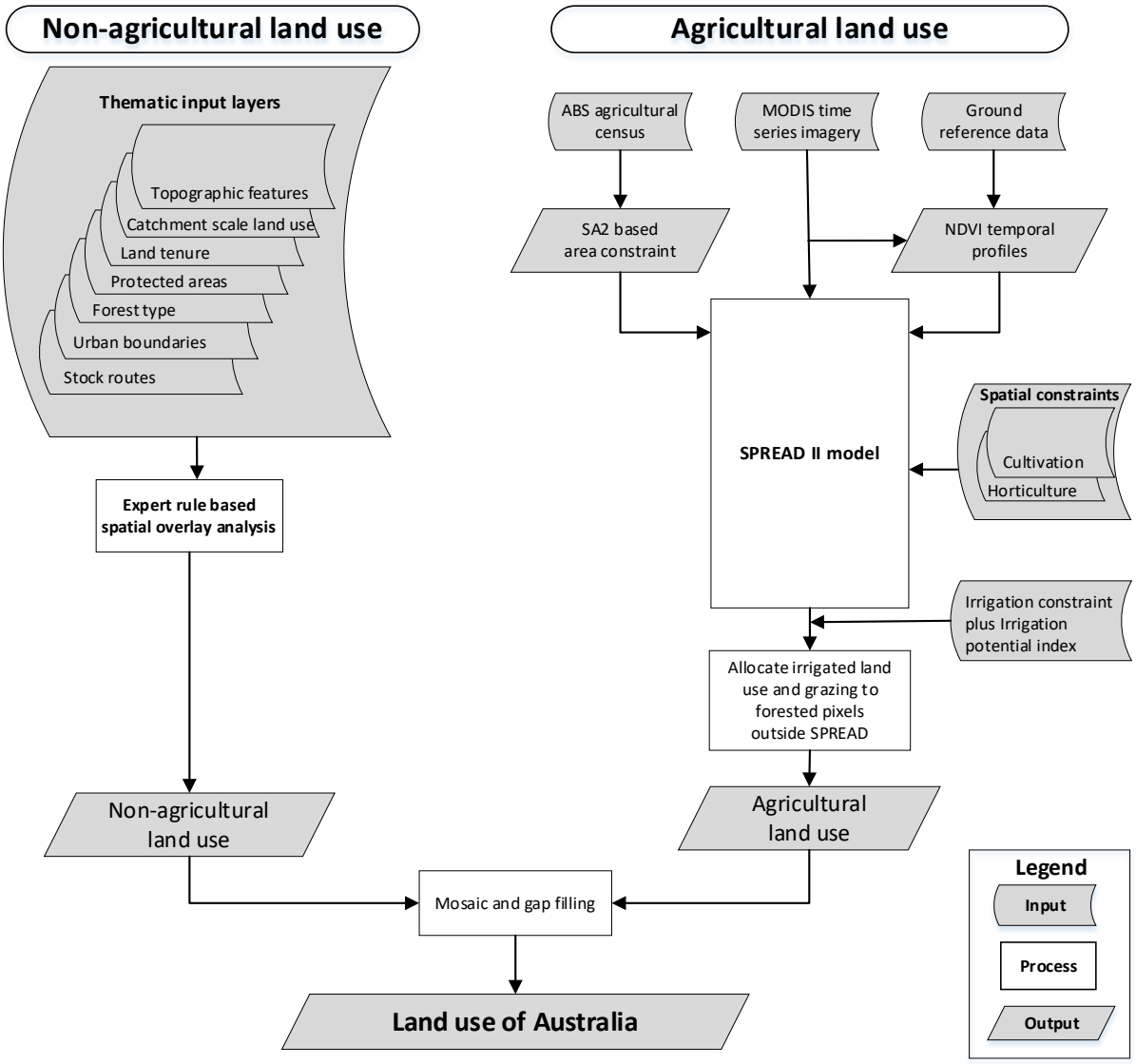
The SPREAD II outputs comprise agricultural commodity probability surfaces (floating point rasters converted to integers of Int16 data type) and categorical summary land use maps for agricultural commodities (integer grids).

Additional grazing land was allocated outside SPREAD II for pixels with forest crown cover less than 80% and without a non-agricultural land use. This additional area was allocated preferentially to pixels with lower forest crown cover and lower slope, as grazing was assumed to be more likely on flatter and less densely forested land. Forest crown cover data originated from the forest type thematic layer. Slope data originated from CSIRO Land and Water's Slope relief 3" resolution dataset (Speight 2009) derived from the United States Geological Survey (USGS) Shuttle Radar Topography Mission (SRTM) (Farr et al. 2007).

All data processing outside SPREAD II used the Python spatial libraries Geospatial Data Abstraction Library (GDAL) (v2.4.1), Rasterio (v1.1.2) and GeoPandas (v0.6.2) within Anaconda Python Distribution. All processing was performed using the Geocentric Datum of Australian 1994 (GDA94) geographic coordinate system (EPSG: 4283). For reporting purposes, all data aligns to a 250 m rasterised version of the Statistical Area Level 2 (SA2) Australian Statistical Geography Standard shapefile (Australian Bureau of Statistics 2016a).

Figure 1 provides the process flow diagram for the construction of the individual land use rasters. This methodology builds on the work of Smart (2016), Smart et al (2006), Stewart et al (2001) and Walker and Mallawaarachchi (1998). Refer to Devadas et al (forthcoming) for further details particularly in their use for reporting land use change.

Figure 1. Process flow to generate the Land use of Australia rasters



Positional accuracy:

Horizontal: ±0.002197 (~ ±250 metres)

Vertical: not applicable

Attribute accuracy:

Attributes are compiled exercising due care and skill. However, attribute accuracy depends in part on the accuracy of input datasets and therefore cannot be guaranteed. The accuracy of the non-agricultural land use assignments is reasonably high whilst the accuracy of the agricultural land use allocations based on automated interpretation of NDVI images is variable. The probability rasters give an indication of the confidence in the agricultural land use allocations for those classes mapped within SPREAD II. The methods for mapping and classifying land use adhere to the standards outlined in 'Guidelines for land use mapping in Australia: principles, procedures and definitions, 4th edition (ABARES 2011) using 'The Australian Land Use and Management Classification Version 8' (ABARES 2016b).

Logical consistency:

Data was used from authoritative sources and are reliant on the logical consistency of input datasets. The logical consistency of the automated, rule-based land use assignments has been assessed independently by jurisdictions. This rule set is based on that used in previous Land use of Australia datasets. The rule set follows the principles of the 'Australian Land Use and Management Classification Version 8' (ABARES 2016b) considering level of intervention in the landscape and the reporting of prime use.

Completeness:

Datasets provide coverage for 100% of Australia excluding external territories. Classification and verification have been assessed by ACLUMP partners and major issues addressed in the final dataset.

Information about the product description

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Description custodian:

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Additional metadata

REFERENCES

ABARES 2011, Guidelines for land use mapping in Australia: principles, procedures and definitions, A technical handbook supporting the Australian Collaborative Land Use and Management Program, 4th edition, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

-- -- 2016a, Forests of Australia (2013) v2.0, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

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-- -- 2012b, 4618.0 – Water use on Australian farms, 2010–11, Australian Bureau of Statistics.

-- -- 2016a, 1270.0.55.001 - Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, Australian Bureau of Statistics.

-- -- 2016b, 1270.0.55.004 – Australian Statistical Geography Standard (ASGS): Volume 4 – Significant Urban Areas, Urban Centres and Localities, Section of State, Australian Bureau of Statistics.

-- -- 2017a, 7121.0 - Agricultural Commodities, Australia, 2015–16, Australian Bureau of Statistics.

-- -- 2017b, 4618.0 – Water use on Australian farms, 2015–16, Australian Bureau of Statistics.

Davey, S & Dunn, G 2014, Australian native forest commerciality, ABARES technical report 14.3, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra.

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-- -- 2012b, Collaborative Australian Protected Areas Database - Terrestrial, Australian Government Department of Agriculture, Water and the Environment.

-- -- 2012c, World Heritage Areas, Australian Government Department of Agriculture, Water and the Environment.

-- -- 2016a, Collaborative Australian Protected Areas Database - Marine, Australian Government Department of Agriculture, Water and the Environment.

-- -- 2016b, Collaborative Australian Protected Areas Database - Terrestrial, Australian Government Department of Agriculture, Water and the Environment.

-- -- 2018a, Collaborative Australian Protected Areas Database - Marine, Australian Government Department of Agriculture, Water and the Environment.

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Appendix 1 – Colour tables

Table A1.1 Primary land use classification symbology as RGB and hexadecimal colour values (ALUMV8_Primary[.lyr, .clr])

VALUE	PRIMV8	Red	Green	Blue	Hex	Colour
1	Conservation and natural environments	202	122	245	#CA7AF5	
2	Production from relatively natural environments	255	255	190	#FFFFBE	
3	Production from dryland agriculture and plantations	255	170	0	#FFAA00	
4	Production from irrigated agriculture and plantations	115	76	0	#734C00	
5	Intensive uses	255	0	0	#FF0000	
6	Water	0	0	255	#0000FF	

Note: Codes refer to the Australian Land Use and Management (ALUM) Classification, version 8.

Table A1.2 Secondary land use classification symbology as RGB and hexadecimal colour values (ALUMV8_Secondary[.lyr, .clr])

VALUE	SECV8	Red	Green	Blue	Hex	Colour
100; 110; 111; 112; 113; 114; 115; 116; 117	1.1 Nature conservation	150	102	204	#9666CC	
120; 121; 122; 123; 124; 125	1.2 Managed resource protection	201	190	255	#C9BEFF	
130; 131; 132; 133; 134	1.3 Other minimal use	222	135	221	#DE87DD	
200; 210	2.1 Grazing native vegetation	255	255	229	#FFFFE5	
220; 221; 222	2.2 Production native forests	41	137	68	#298944	
310; 311; 312; 313; 314	3.1 Plantation forests	173	255	181	#ADFFB5	
300; 320; 321; 322; 323; 324; 325	3.2 Grazing modified pastures	255	211	127	#FFD37F	
330; 331; 332; 333; 334.; 335; 336; 337; 338	3.3 Cropping	255	255	0	#FFFF00	
340; 341; 342; 343; 344; 345; 346; 347; 348; 349	3.4 Perennial horticulture	171	135	120	#AB8778	
350; 351; 352; 353	3.5 Seasonal horticulture	87	58	64	#573A40	
360; 361; 362; 363; 364; 365	3.6 Land in transition **a**	0	0	0	#000000	
410; 411; 412; 413; 414	4.1 Irrigated plantation forests	236	255	224	#ECFFE0	
400; 420; 421; 422; 423; 424	4.2 Grazing irrigated modified pastures	255	170	0	#FFAA00	
430; 431; 432; 433; 434; 435; 436; 437; 438	4.3 Irrigated cropping	201	184	84	#C9B854	
440; 441; 442; 443; 444; 445; 446; 447; 448; 449	4.4 Irrigated perennial horticulture	156	84	46	#9C542E	
450; 451; 452; 453; 454	4.5 Irrigated seasonal horticulture	79	43	23	#4F2B17	
460; 461; 462; 463; 464; 465	4.6 Irrigated land in transition **a**	52	52	52	#343434	
510; 511; 512; 513; 514; 515	5.1 Intensive horticulture	255	201	190	#FFC9BE	
520; 521; 522; 523; 524; 525; 526; 527; 528	5.2 Intensive animal production	255	135	190	#FF87BE	
530; 531; 532; 533; 534; 535; 536; 537; 538	5.3 Manufacturing and industrial	115	76	0	#734C00	
540; 541	5.4.0, 5.4.1 Urban residential	255	0	0	#FF0000	
542; 543; 544; 545	5.4.2, 5.4.3, 5.4.4, 5.4.5 Rural residential and farm infrastructure	156	156	156	#9C9C9C	
500; 550; 551; 552; 553; 554; 555	5.5 Services	155	0	0	#9B0000	

VALUE	SECV8	Red	Green	Blue	Hex	Colour
560; 561; 562; 563; 564; 565; 566; 567	5.6 Utilities	255	127	127	#FF7F7F	
570; 571; 572; 573; 574; 575	5.7 Transport and communication	168	0	0	#A80000	
580; 581; 582; 583; 584	5.8 Mining	71	130	143	#47828F	
590; 591; 592; 593; 594; 595	5.9 Waste treatment and disposal	41	73	82	#294952	
610; 611; 612; 613; 614	6.1 Lake	0	0	255	#0000FF	
600; 620; 621; 622; 623	6.2 Reservoir/dam	0	197	255	#00C5FF	
630; 631; 632; 633	6.3 River	0	112	255	#0070FF	
640; 641; 642; 643	6.4 Channel/aqueduct	0	77	168	#004DA8	
650; 651; 652; 653; 654	6.5 Marsh/wetland	115	178	255	#73B2FF	
660; 661; 662; 663	6.6 Estuary/coastal waters	190	210	255	#BED2FF	

a These classes are included for completeness but are not present in the datasets.

Note: Codes refer to the Australian Land Use and Management (ALUM) Classification, version 8.

Table A1.3 Simplified 18-class land use classification symbology as RGB and hexadecimal colour values (ALUMV8_18Class[.lyr, .clr])

VALUE	CL18	Red	Green	Blue	Hex	Colour
100; 110; 111; 112; 113; 114; 115; 116; 117	Nature conservation	150	102	204	#9666CC	
120; 121; 122; 123; 124; 125	Managed resource protection	201	190	255	#C9BEFF	
130; 131; 132; 133; 134	Other minimal use	222	135	221	#DE87DD	
200; 210	Grazing native vegetation	255	255	229	#FFFFE5	
220; 221; 222	Production native forests	41	137	68	#298944	
300; 320; 321; 322; 323; 324; 325	Grazing modified pastures	255	211	127	#FFD37F	
310; 311; 312; 313; 314; 410; 411; 412; 413; 414	Plantation forests	173	255	181	#ADFFB5	
330; 331; 332; 333; 334; 335; 336; 337; 338	Dryland cropping	255	255	0	#FFFF00	
340; 341; 342; 343; 344; 345; 346; 347; 348; 349; 350; 351; 352; 353	Dryland horticulture	171	135	120	#AB8778	
360; 361; 362; 363; 364; 365; 460; 461; 462; 463; 464; 465	Land in transition **a**	0	0	0	#000000	
400; 420; 421; 422; 423; 424	Irrigated pastures	255	170	0	#FFAA00	
430; 431; 432; 433; 434; 435; 436; 437; 438	Irrigated cropping	201	184	84	#C9B854	
440; 441; 442; 443; 444; 445; 446; 447; 448; 449; 450; 451; 452; 453; 454	Irrigated horticulture	156	84	46	#9C542E	
500; 530; 531; 532; 533; 534; 535; 536; 537; 538; 540; 541; 550; 551; 552; 553; 554; 555; 560; 561; 562; 563; 564; 565; 566; 567; 570; 571; 572; 573; 574; 575	Urban intensive uses	255	0	0	#FF0000	
510; 511; 512; 513; 514; 515; 520; 521; 522; 523; 524; 525; 526; 527; 528	Intensive horticulture and animal production	255	201	190	#FFC9BE	
542; 543; 544; 545	Rural residential and farm infrastructure	178	178	178	#B2B2B2	
580; 581; 582; 583; 584; 590; 591; 592; 593; 594; 595	Mining and waste	71	130	143	#47828F	
600; 610; 611; 612; 613; 614; 620; 621; 622; 623; 630; 631; 632; 633; 640; 641; 642; 643; 650; 651; 652; 653; 654; 660; 661; 662; 663	Water	0	0	255	#0000FF	

a This class is included for completeness but is not present in the datasets.

Note: Codes refer to the Australian Land Use and Management (ALUM) Classification, version 8.

Table A1.4 Agricultural industries classification symbology as RGB and hexadecimal colour values (ALUMV8_Agricultural_industries[.lyr, .clr])

VALUE	AGIND	Red	Green	Blue	Hex	Colour
210	Grazing native vegetation	217	214	207	#D9D6CF	
300; 320; 321; 322; 323; 324; 325; 360; 361; 362; 363; 364; 365; 400; 420; 421; 422; 423; 424; 460; 461; 462; 463; 464; 465	Grazing modified pastures	205	213	70	#CDD546	
330; 331; 332; 333; 334; 335; 336; 337; 338; 430; 431; 432; 433; 434; 435; 436; 437; 438	Cropping	114	136	26	#72881A	
340; 341; 342; 343; 344; 345; 346; 347; 348; 349; 350; 351; 352; 353; 440; 441; 442; 443; 444; 445; 446; 447; 448; 449; 450; 451; 452; 453; 454	Horticulture	230	0	0	#E60000	
510; 511; 512; 513; 514; 515; 520; 521; 522; 523; 524; 525; 526; 527; 528	Intensive plant and animal industries	115	223	255	#73DFFF	
100; 110; 111; 112; 113; 114; 115; 116; 117; 120; 121; 122; 123; 124; 125; 130; 131; 132; 133; 134; 220; 221; 222, 310; 311; 312; 313; 314; 410; 411; 412; 413; 414; 500; 530; 531; 532; 533; 534; 535; 536; 537; 538; 540; 541; 550; 551; 552; 553; 554; 555; 560; 561; 562; 563; 564; 565; 566; 567; 570; 571; 572; 573; 574; 575; 542; 543; 544; 545; 580; 581; 582; 583; 584; 590; 591; 592; 593; 594; 595; 600; 610; 611; 612; 613; 614; 620; 621; 622; 623; 630; 631; 632; 633; 640; 641; 642; 643; 650; 651; 652; 653; 654; 660; 661; 662; 663	Other uses	255	255	255	#FFFFFF	

Note: Codes refer to the Australian Land Use and Management (ALUM) Classification, version 8.

Appendix 2 – Land use thematic input layers descriptions

Table A2.1 Values, description, and meanings of protected areas layers' attributes

PA	PA_DESC	Meaning
0	Not a protected area	Not a protected area
11	Ia. Strict nature reserve	IUCN category Ia protected area: strict nature reserve; a protected area managed mainly for science
12	Ib. Wilderness area	IUCN category Ib protected area: wilderness area; a protected area managed mainly for wilderness protection
20	II. National park	IUCN category II protected area: national park; a protected area managed mainly for ecosystem conservation and recreation
30	III. Natural monument	IUCN category III protected area: natural monument; a protected area managed for conservation of specific natural features
40	IV. Habitat/species management area	IUCN category IV protected area: habitat/species management area; a protected area managed mainly for conservation through management intervention
50	V. Protected landscape/seascape	IUCN category V protected area: protected landscape/seascape; a protected area managed mainly for landscape/seascape conservation and recreation
60	VI. Managed resource protected areas	IUCN category VI protected area: managed resource protected area; a protected area managed mainly for the sustainable use of natural ecosystems

PA	PA_DESC	Meaning
70	Other conserved area	Other conservation areas including protected areas without a prescribed IUCN management

Note: IUCN is the International Union for the Conservation of Nature.

Table A2.2 Values, description and meanings of the topographic features layers' attributes

TOPO	TOPO_DESC	Meaning
0	Not a topographic feature	Not classified as a topographic feature
1	Lake-perennial	A naturally occurring body of mainly static water surrounded by land; normally contains water for the whole year, except during unusually dry periods, in at least nine years out of ten
2	Lake-non-perennial	A naturally occurring body of mainly static water surrounded by land; contains water for several months of each year or only contains water intermittently
3	Watercourse-perennial	A natural channel along which water may flow from time to time; normally contains water for the whole year, except during unusually dry periods, in at least nine years out of ten
4	Watercourse-non-perennial	A natural channel along which water may flow from time to time; contains water for several months of each year or only contains water intermittently
5	Swamp	Land which is so saturated with water that it is not suitable for agricultural or pastoral use and presents a barrier to free passage
6	Marine swamp	That low lying part of the backshore area of tidal waters, usually immediately behind a saline coastal flat, which maintains a high salt water content, and is covered with characteristic thick grasses and reed growths
7	Saline coastal flat	That nearly level tract of land between mean high water and the line of the highest astronomical tide
8	Reservoir	A body of water collected and stored behind a constructed barrier for some specific use
12	Mine area	An excavation made by the removal of stone, gravel, clay or mineral from the ground for commercial or industrial purposes and tailings dumps from mining operations
13	Pond-aquaculture	Shallow beds, usually segmented by constructed walls, for the use of aquaculture
14	Pond-salt evaporator	A flat area, usually segmented, used for the commercial production of salt by evaporation
15	Pond-effluent	Shallow beds, usually segmented by constructed walls, for the treatment of sewage or other wastes
19	Estuary	The part of the mouth or lower course of a river in which its current meets the sea's tides, and is subject to their effects
20	Farm dam	Water stored for on-site, immediate use on a farm
21	Flood irrigation storage	A body of water collected and stored behind constructed barriers, for the specific use of flooding pastures via internal irrigation systems
22	Desalination plant	A facility where the process of removing salt from sea water takes place
23	Fuel depot	Land and buildings used in the refinement or storage of petroleum products
24	Built-up-commercial	Business areas with low or zero population count
25	Built-up-education	Educational facilities such as primary/secondary schools and universities
26	Built-up-hospital	Hospital or medical facilities, including aged care facilities
27	Industrial	Land containing a number of businesses, and where possible, have a zero population count
28	Parkland	Parkland, natural reserves, and other minimal use protected or conserved areas; any public open space and sporting arena or facility whether enclosed or open to the public, including racecourses, golf courses, and stadiums
30	Urban residential	Areas whose predominant land use includes houses, duplexes, apartments, serviced/long stay apartments, townhouses, gated communities, complexes, caravan parks, retirement villages, military bases where people live, and prisons
31	Transport	Road or rail features
34	Quarries	Land from which stone, gravel, clay, slate, sand, soil and rock is being extracted
35	Rural residential	Rural allotments with no agricultural activity present

TOPO	TOPO_DESC	Meaning
36	Built-up-airport	Defined area of a facility licensed, certified, or registered by the Civil Aviation Safety Authority intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft and associated cargo
37	Tailings dams	Earth-fill embankment edam used to store by-products of mining operations after the ore has been extracted
38	Abandoned mines	Land formally used for extractive industry but no longer in use
39	Rehabilitated mines	Former mining sites undergoing remediation to return them near to their natural state or a state suitable for farming
42	Waste-transfer station	Depot that receives and temporarily stores waste before routing to further processing or disposal
43	Waste-landfill	Land for disposal of solid inert wastes
44	Prohibited areas	Military and other prohibited areas

Note: Water Observations from Space (WOfS) data (Geoscience Australia 2018) for 2010-11 and 2015-16 was used to mark potential water pixels in the Topographic features layers. This applied to those pixels where the WOfS data observed water more frequently and with confidence. Pixels where water was detected, but no topographic feature was present in the layer were allocated a TOPO value of 100 and the TOPO_DESC of 'Water observed – no current topographic feature'. For topographic features where water was also detected according to WOfS their TOPO value was increased by 100 with the TOPO_DESC for these attributes having ' – Water observed' added.

Table A2.3 Values, description, and meanings of tenure layers' attributes

TEN	TEN_DESC	Meaning
0	No data/offshore	Ocean or estuary with no tenure, or areas where the tenure is unresolved
1001	Freehold	Land title holder has the power to sell, lease, licence and mortgage the land. Minerals and petroleum remain property of the Crown. All dealings are subject to compliance to planning and environmental laws, including the protection of heritage and sacred sites. May include freehold land purchased by Aboriginal land trusts through the open market.
1002	Freehold - Indigenous	Land granted to an Aboriginal land trust as freehold. The power to sell, lease and licence the land varies with jurisdiction legislation. Minerals and petroleum rights and acquisition powers of the Crown varies between jurisdictions.
2111	Freeholding lease	Crown leasehold land where a lessee is in the process of transferring lease to freehold with instalments
2121	Pastoral perpetual lease	Crown leasehold land granted in perpetuity to an entity for primarily pastoral purposes
2131	Other perpetual lease	Crown leasehold land granted in perpetuity to an entity for non-pastoral or non-specified purposes
2132	Other perpetual lease - Indigenous	Crown leasehold land granted in perpetuity to an Indigenous land trust for non-pastoral or non-specified purposes
2141	Pastoral term lease	Crown leasehold land granted for a specified term of years to an entity for primarily pastoral purposes
2142	Pastoral term lease - Indigenous	Crown leasehold land granted for a specified term of years to an Indigenous land trust for primarily pastoral purposes
2151	Other term lease	Crown leasehold land granted to an entity for a specified term of years for non-pastoral or non-specified purposes
2152	Other term lease - Indigenous	Crown leasehold land granted to an Indigenous land trust for a specified term of years for non-pastoral or non-specified purposes
2161	Other lease	Crown leasehold land where the purpose is specified as other or undefined
2162	Other lease - Indigenous	Crown leasehold land where the purpose is specified as other or undefined and held by an Indigenous land trust
2211	Nature conservation reserve	Crown land set aside for conservation purposes. Includes heritage reserves where specified.
2212	Nature conservation reserve - Indigenous	Crown land vested or reserved to an Indigenous lands trust and set aside for conservation purposes. Includes heritage reserves where specified.
2221	Multiple-use public forest	Crown land set aside for multiple-use forest values such as wood harvesting, recreation, and environmental protection, includes state forests and timber reserves

TEN	TEN_DESC	Meaning
2231	Other Crown purposes	Crown land set aside for all other purposes including, water, infrastructure, institutional, defence and other undefined reserves; or lands vested to, acquired, or purchased by the Crown or its authorised entities to deliver essential services
2232	Other Crown purposes - Indigenous	Crown land vested or reserved to an Indigenous land trust for the benefit of the Indigenous
2301	Other Crown land	Crown land unallocated to a purpose or purposes
2302	Other Crown land - Indigenous	Unallocated Crown land held by an Indigenous land trust

Table A2.4 Values, description, and meanings of forest type layers' attributes

FOR	FOR_DESC	Meaning
0	Non-forest or no data	Non-forest (crown cover less than 20%) or no data
1	Native woodland forest	Native woodland forest (crown cover between 20 and 50%)
2	Native open forest	Native open forest (crown cover greater than 50 to 80%)
3	Native closed forest	Native closed forest (crown cover greater than 80%)
4	Commercial plantation - hardwood	Commercial plantation - hardwood
5	Commercial plantation - softwood	Commercial plantation - softwood
6	Commercial plantation - mixed species	Commercial plantation - mixed species
7	Unknown forest	Unknown forest (crown cover greater or equal to 20%)
8	Native rainforest other than Tasmania	Native rainforest other than Tasmania
9	Native rainforest Tasmania	Native rainforest Tasmania

Table A2.5 Values, description, and meanings of urban boundaries layers' attributes

URBAN	URBAN_DESC	Meaning
0	Rural balance	Land within a state or territory not within a major urban, other urban, nor bounded locality area
1	Major urban	Urban centres with a population of 100,000 or more
2	Other urban	Urban centres with a population between 1,000 and 99,999
3	Bounded locality	Rural localities with a population typically 200 to 1,000 but can include some large localities with a population greater than 1,000

Table A2.6 Values, description, and meanings of stock route layers' attributes

SR	SR_DESC	Meaning
0	No data/offshore	No observed stock route or no data
1	Minimal use managed Crown land (WA only)	Land managed as Crown land other than nature conservation or multiple-use public forest. Managed Crown land can be Crown land or freehold land owned by the Western Australian government.
2	QLD NSW stock routes	New South Wales and Queensland stock routes
3	WA stock routes	Western Australian stock routes
7	QLD grazing licences	Queensland Crown land licenced for grazing activities

Table A2.7 Values and description of irrigation status layers' attributes

IRGN	IRGN_DESC	Meaning
0	Dryland agriculture, not ag or no data	Dryland agriculture, not an agricultural commodity or no data
1	Irrigated agriculture	Irrigated agriculture

Table A2.8 Values and description of agricultural commodity mapping unit layers' attributes

AGMAPU	AGMAPU_DESC	Corresponding probability rasters from SPREAD II
0	Unallocated agricultural land, non-agricultural land or no data	
1	Grazing - native or naturalised pasture or native-exotic pasture mosaic	probabilitySurface_20YY_210_1_GRAZ_NOTIMBNP.tif **a**
3	Grazing sown pastures	probabilitySurface_20YY_320_3_GRAZ_NOTIMBSP.tif **a**
5	Winter cereals	probabilitySurface_20YY_331_5_W_CER.tif
6	Summer cereals excluding rice	probabilitySurface_20YY_331_6_S_CER_EX_RICE.tif
7	Rice	probabilitySurface_20YY_439_7_RICE.tif
8	Winter legumes	probabilitySurface_20YY_338_8_W_LEGUMES.tif
9	Summer legumes	probabilitySurface_20YY_338_9_S_LEGUMES.tif
10	Winter oilseeds	probabilitySurface_20YY_334_10_W_OILSEEDS.tif
11	Summer oilseeds	probabilitySurface_20YY_334_11_S_OILSEEDS.tif
12	Sugar cane	probabilitySurface_20YY_335_12_SUGAR_CANE.tif
13	Pastures and crops for hay and silage	probabilitySurface_20YY_333_13_HAY.tif
14	Cotton	probabilitySurface_20YY_336_14_COTTON.tif
15	Other non-cereal crops	probabilitySurface_20YY_330_15_ONCC.tif
16	Vegetables	probabilitySurface_20YY_353_16_VEGETABLES.tif
17	Citrus	probabilitySurface_20YY_348_17_CITRUS.tif
18	Apples	probabilitySurface_20YY_341_18_APPLES.tif
19	Pears and other pome fruit	probabilitySurface_20YY_341_19_PEARS_OTH_PME.tif
20	Stone fruit excluding tropical	probabilitySurface_20YY_341_20_ST_FRT_EX_TRP.tif
21	Tropical stone fruit	probabilitySurface_20YY_341_21_TROP_STONE_FR.tif
22	Nuts	probabilitySurface_20YY_343_22_NUTS.tif
23	Berry fruit	probabilitySurface_20YY_345_23_BERRY_FRT.tif
24	Plantation fruit	probabilitySurface_20YY_340_24_PLANTATION_FR.tif
25	Grapes	probabilitySurface_20YY_349_25_GRAPES.tif

Note: 20YY denotes 2011 for 2010–11 and 2016 for 2015–16. Probability rasters naming convention probabilitySurface_20YY_[ALUM]_[AGMAPU]_[AGMAP_DESC abbreviated].tif; NOTIMB = not in native woodland forest or native open forest; _W_ = Winter ; _S_ = Summer. **a** Probability surface represents only part of the AGMAPU as those areas with native forest crown cover of less than 80% are mapped outside SPREAD II.

Appendix 3 – Change descriptions

Table A3.1 Values, description, and meanings of the land use observed change (LUCH) attribute

	LUCH_DESC	Meaning
0	No data/offshore	No data/offshore
1	Observed difference/change	Change has been observed between 2010–11 and 2015–16, at 18-class summary classification level.
2	No observed difference/change	No change has been observed between 2010–11 and 2015–16, at 18-class summary classification level

Appendix 4 - Data sources

Table A4.1 Land use of Australia data sources used for 2010–11 and 2015–16

Process	Dataset	Data custodian	Currency dates	
			2010-11	2015-16
Protected areas layer	Collaborative Australian Protected Areas Database - Marine	Department of Agriculture, Water and the Environment	2012, 2018 **a**	2016, 2018 **a**
Protected areas layer	Collaborative Australian Protected Areas Database - Terrestrial	Department of Agriculture, Water and the Environment	2012, 2018 **a**	2016, 2018 **a**
Protected areas layer	Australia, World Heritage Areas **b**	Department of Agriculture, Water and the Environment	2012, 2020 **a**	2020 **a**
Topographic features layer	GEODATA TOPO 250K Series 3 – Hydrography - Pondage areas	Geoscience Australia	2006	2006
Topographic features layer	Surface Hydrology Polygons (National)	Geoscience Australia	2015	2015
Topographic features layer	National Aviation Facilities	Geoscience Australia	2012	2012
Topographic features layer	Wastewater Treatment Plants	Geoscience Australia	2012	2012
Topographic features layer	National Liquid Fuel Depot Areas	Geoscience Australia	2012	2012
Topographic features layer	National Liquid Fuel Refinery Areas	Geoscience Australia	2012	2012
Topographic features layer	Major Desalination Plants	Geoscience Australia	2012	2012
Topographic features layer and irrigation allocation	Water Observations from Space	Geoscience Australia	2010	2015
Topographic features layer	2074.0 – Census of Population and Housing: Mesh Block Counts, Australia	Australian Bureau of Statistics	2011	2016
Topographic features layer	1270.0.55.001 - Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas.	Australian Bureau of Statistics	2011	2016
Topographic features layer	1270.0.55.004 – Australian Statistical Geography Standard (ASGS): Volume 4 – Significant Urban Areas, Urban Centres and Localities, Section of State	Australian Bureau of Statistics	2011	2016
Catchment scale land use layer	Catchment Scale Land Use Mapping for the Australian Capital Territory 2012	ABARES, Department of Agriculture, Water and the Environment	2012	2012
Catchment scale land use layer	Land Use Mapping Project of the Northern Territory	NT Department of Environment, Parks and Water Security	2008	2016-2017
Catchment scale land use layer	NSW Landuse	NSW Department of Planning, Industry and Environment	2013	2013, 2017
Catchment scale land use layer	Land use mapping – Queensland	Queensland Department of Environment and Science	2010	2015
Catchment scale land use layer	Land use mapping – Queensland - Fitzroy	Queensland Department of Environment and Science	2009	2017
Catchment scale land use layer	Land use mapping – Queensland – Mackay	Queensland Department of Environment and Science	2009	2016

Process	Dataset	Data custodian	Currency dates	
			2010-11	2015-16
Catchment scale land use layer	Land use mapping – Queensland – Wet tropics	Queensland Department of Environment and Science	2009	2015
Catchment scale land use layer	Land use mapping – Queensland - Burdekin	Queensland Department of Environment and Science	2009	2016
Catchment scale land use layer	Land use mapping – Queensland – Burnett Mary	Queensland Department of Environment and Science	2009	2017
Catchment scale land use layer	Land Use 2008 (South Australia)	SA Department of Environment, Water and Natural Resources	2008	2008
Catchment scale land use layer	Land Use 2016 (Adelaide Hills and Northern Adelaide Plains)	SA Department of Environment and Water	na	2016
Catchment scale land use layer	Land Use 2014 (South East and SA River Murray corridor)	SA Department of Environment and Water	na	2014
Catchment scale land use layer	Tasmanian Land Use	Tasmania Department of Natural Resources and Environment	2009-2010	2015
Catchment scale land use layer	Victorian Land Use Information System (VLUIS)	Victoria Department of Jobs, Precincts and Regions	2010-2011	2016-2017
Catchment scale land use layer	Land Use in Western Australia v7	WA Department of Agriculture and Food	2008	na
Catchment scale land use layer	WA Cape to Cape Land Use	WA Department of Primary Industries and Regional Development	2014	2014
Catchment scale land use layer	Catchment Scale Land Use Mapping for Western Australia 2018	ABARES / WA Department of Primary Industries and Regional Development	2012, 2018	2018
Land tenure layer	Land tenure of Australia 2010-11 to 2015-16	ABARES, Department of Agriculture, Water and the Environment	2010-2011	2015-2016
Forest type layer, allocating grazing outside SPREAD II	Forests of Australia	ABARES, Department of Agriculture, Water and the Environment	2013 (v2.0)	2018
Stock routes layer	Stock routes – Queensland	Queensland Department of Natural Resources	2007	2007
Stock routes layer	Conservation value of NSW Travelling Stock Reserves (TSRs)	Department of Regional New South Wales	2017	2017
Stock routes layer	Cadastral data - Queensland Series	Queensland Department of Natural Resources	December 2010	May 2016
Stock routes layer	Cadlite; Land Tenure	PSMA Australia	February 2012 (2012)	February 2017 (date range 2015-2016)
SPREAD II	Terra Moderate Resolution Imaging Spectroradiometer (MODIS) satellite	NASA	April 2010 – March 2011	April 2015 – March 2016
SPREAD II	7121.0 - Agricultural Commodities, Australia	Australian Bureau of Statistics	2010-11	2015-16
SPREAD II	4618.0 – Water use on Australian farms	Australian Bureau of Statistics	2010-11	2015-16
SPREAD II	Ground reference points	State government agencies, Coleambally Irrigation Co-operative Limited, the United States Geological Survey	2000-2017	2000-2017
Allocating grazing outside SPREAD II	Slope relief (3" resolution) **c**	CSIRO Land and Water	2000	2000
Cultivation constraint **d**	National Vegetation Information System - Major Vegetation Groups (Version 6.0)	Department of Agriculture, Water and the Environment	2021	2021

Process	Dataset	Data custodian	Currency dates	
			2010-11	2015-16
Cultivation constraint	NSW Native Vegetation Extent 5m Raster v1.2	NSW Department of Planning, Industry and Environment	2019	2019
Cultivation constraint	Current extent of native vegetation - Western Australia	WA Department of Primary Industries and Regional Development	2020	2020
Cultivation constraint	Remnant vegetation cover - 2017	Queensland Department of Environment and Science	2017	2017

Note: Data currency may vary from publication date. **a** The gazettal field was used to sort data appropriate for each target field. Only parcels reflecting the target year were taken from these datasets. **b** World Heritage Areas managed as one or more of IUCN categories 1a to V. **c** Derived from NASA's Digital Elevation - Shuttle Radar Topography Mission February 2000. **d** ALUM v8 classes used from Catchment scale land use layer for Cultivation constraint: 3.3.0 to 3.5.3 (excluding 3.4.6) and 4.2.0 to 4.5.4 (excluding 4.4.6); Horticulture constraint: 3.4.0 to 3.5.3 (excluding 3.4.6) and 4.4.0 to 4.5.4 (excluding 4.4.6); Irrigation constraint: 4.2.0 to 4.6.5.