Resource title	*Forests of Australia (2018)* dataset
Citation	Australian Bureau of Agricultural and Resource Economics and Sciences, *Forests of Australia (2018)*, Australian Bureau of Agricultural and Resource Economics and Sciences, Canberra, December. CC BY 4.0
Digital object identifier (DOI)	www.doi.org/10.25814/5c59170ec780d
Custodian	Australian Government Department of Agriculture and Water Resources – Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)
Jurisdiction	Australia
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Abstract	*Forests of Australia (2018)* is a continental spatial dataset of forest extent, by national forest categories and types, assembled for *Australia's State of the Forests Report 2018*. It was developed from multiple forest, vegetation and land cover data inputs, including contributions from Australian, state and territory government agencies and external sources. A forest is defined in this dataset as "*An area, incorporating all living and non-living components, that is dominated by trees having usually a single stem and a mature or potentially mature stand height exceeding two metres and with existing or potential crown cover of overstorey strata about equal to or greater than 20 per cent. This includes Australia's diverse native forests and plantations, regardless of age. It is also sufficiently broad to encompass areas of trees that are sometimes described as woodlands*". The dataset was compiled by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) for the National Forest Inventory (NFI), a collaborative partnership between the Australian and state and territory governments. The role of the NFI is to collate, integrate and communicate information on Australia's forests. State and territory government agencies collect forest data using independent methods and at varying scales or resolutions. The NFI applies a national classification to state and territory data to allow seamless integration of these datasets. Multiple independent sources of external data are used to fill data gaps and improve the quality of the final dataset. The NFI classifies forests into three national forest categories (Native forest, Commercial plantation, and Other forest) and then into various forest types. Commercial plantations presented in this dataset were sourced from the National Plantation Inventory (NPI) spatial dataset (2016), also produced by ABARES. Another dataset produced by ABARES, the Catchment scale Land Use and Management (CLUM) dataset (2016), was used to identify and mask out land uses that are inappropriate to map as forest.

	The *Forests of Australia (2018)* dataset is produced to fulfil requirements of Australia's *National Forest Policy Statement* and the *Regional Forests Agreement Act 2002* (Cwth), and is used by the Australian Government for domestic and international reporting. Previous versions of this dataset are available on the Forests Australia website spatial data page and the Australian Government open government data portal data.gov.au.
Purpose	For describing Australia's forest extent, as reported in the *Australia's State of the Forests Report (2018)*.
ANZLIC search words	FORESTS FORESTS Natural FORESTS Plantation AGRICULTURE VEGETATION VEGETATION Floristic VEGETATION Structural
Keyword(s)	Forest Forest cover Land cover Forest type Plantation Vegetation Vegetation cover Tree cover Woody cover Australia
Sources used to generate this dataset and/or resource	See Table 1 and Table 2, (Appendix 1) below, which are Table 1.12 and Table 1.13 of *Australia's State of the Forests Report 2018*
Publication date	December 2018
Latest date of information/currency	30 June 2016
Data file name	aus_for18
Stored data format	GIS files created using Esri ArcGIS 10.2 software: **Grid** (raster) and **Layer file** formats – zipped
Compressed file size	44 MB
Geographic extent	Australia excluding external territories
	North bounding Latitude: -8.2° South bounding Latitude: -44.4° East bounding Longitude: 157.2° West bounding Longitude: 109.5°
Spatial resolution/ cell size	1 hectare/100 x 100 metre
Spatial reference	ESPG:3577 GDA94 Australian Albers

	Coordinate system: GDA_1994_Albers False Easting: 0 False Northing: 0 Central meridian: 132° Standard parallels: -18°, -36° Latitude of origin: 0° Datum: D_GDA_1994
Positional accuracy	Horizontal: ±100 metres Vertical: not applicable
Attribute accuracy	Attributes are compiled exercising due care and skill. However, accuracy of attributes is in part dependent on accuracy of data supplied to ABARES and therefore cannot be guaranteed.
Completeness	Coverage: Dataset provides coverage of 100% of Australia excluding external territories. Attributes: Forest Category and Forest Type information is present for over 99.0% of Australia.
Update frequency	5 years
Licencing	[Creative Commons by Attribution 4.0 International](#) (CC BY 4.0)
Access constraints	No restriction, nil cost.
Use constraints	CC BY 4.0 permits: Share – users may copy and redistribute the material in any medium or format. Adapt – users may remix, transform, and build upon the material for any purpose, even commercially. Attribution – users must give appropriate credit using the citation listed, provide a link to the licence, and indicate if changes were made. Users may do so in any reasonable manner, but not in any way that suggests the licensor endorses the use.
Security constraints	Classification: Unclassified
Legal constraints	The Australian Government acting through the Department of Agriculture and Water Resources, 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 and Water Resources, 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.
Metadata date	16 February 2019
Additional metadata	Documentation on dataset lineage, and attribute data descriptions and lookup tables for the Forests of Australia (2018) dataset, are available from the *Forests of Australia (2018)* spatial data webpage.

Appendix 1

Table 1: Key input datasets used to develop Forests of Australia 2018 dataset using Multiple Lines of Evidence approach

Dataset	Description
Forests of Australia (2013) v2.0	Forests of Australia (2013) v2.0 is an updated version of the forest cover dataset that was used in SOFR 2013. It is a continental dataset of forest extent by national forest categories and types, and was developed by a Multiple Lines of Evidence process from multiple forest, vegetation and land cover spatial data inputs, including contributions from relevant Australian, state and territory government agencies and external sources
Landsat Foliage Projective Cover – Queensland; also known as QLD State-wide Land and Tree Study (SLATS), 2014–15.	The Queensland government SLATS method calculates Foliage Projective Cover (FPC) values from Landsat satellite Thematic Mapper™ and Enhanced Thematic Mapper Plus (ETM+) images. ABARES uses an empirically derived relationship between FPC and crown-cover values (Scarth et al. 2008) to delineate the landscape into forest and non-forest areas (an FPC of 11% is approximately equivalent to a crown cover of 20%). The SLATS dataset is produced at 30 m × 30 m resolution, and is supported by extensive on-ground validation. The dataset covers the whole of Queensland, was developed to support land-clearance legislation and monitoring of change, and is frequently updated using a consistent methodology and data source (data.qld.gov.au/dataset/statewide-landcover-and-trees-study-2014-15)
NGGI 2016	NGGI datasets are produced from Landsat satellite Thematic Mapper™, Enhanced Thematic Mapper Plus (ETM+) and Operational Land Image (OLI) images for the Australian Government Department of the Environment and Energy, and identifies woody vegetation of height or potential height greater than 2 metres, crown cover greater than 20%, and with a minimum patch size of 0.2 hectares (DoEE 2017c). The dataset is compiled using time-series data since 1972, and is produced at a 25 m × 25 m resolution. It was designed for national carbon accounting and for monitoring changes in Kyoto-compliant forests over long time-periods, and is updated annually using a consistent methodology and data source. The NGGI dataset used was the 2016 data from the 'Woody Extent & Change (version 1.0)' spatial dataset from the Australian Government Department of the Environment and Energy, published in March 2017, which was produced using the algorithms for land-use change allocation developed for the *National Inventory Report 2015* (DoEE 2017c).
SPOT5 Foliage Projective Cover (FPC) – New South Wales; also known as the NSW SLATS 2012	The New South Wales Foliage Projective Cover (FPC) dataset is derived from Satellite Pour l'Observation de la Terre 5 (SPOT5) High Resolution Geometric satellite imagery, using the SLATS methodology described in Scarth et al. (2008). The SPOT5 FPC product used to derive forest cover is produced at 5 m x 5 m resolution. ABARES uses an empirically derived relationship between FPC and crown cover values (Scarth et al. 2008) to delineate the landscape into forest and non-forest areas (an FPC of 11% is approximately equivalent to a crown cover of 20%). The dataset is supported by extensive on-ground validation, and covers the whole of New South Wales. It was developed to support land-clearance legislation and monitoring of change, and is frequently updated using a consistent methodology and data source (data.nsw.gov.au/data/dataset/f267b224-d96a-45b3-b1cb-e3ec3fee45c5)
Persistent Green-Vegetation Fraction (PGVF) (TERN)	PGVF is a national Foliage Projective Cover (FPC) dataset derived from Landsat 5 TM and Landsat 7 ETM+ satellite imagery using an algorithm developed by the Terrestrial Ecosystem Research Network (TERN) (www.auscover.org.au/xwiki/bin/view/Product+pages/Persistent+Green-Vegetation+Fraction)
Catchment Land Use Mapping (CLUM) 2017 land-use mask	The CLUM land-use mask was used to exclude from the MLE forest cover dataset land uses deemed to be not suitable to carry forests, for example urban residential, industrial, mining, horticulture and intensive agriculture. CLUM dataset is produced by ABARES.
NPI 2016 spatial dataset	NPI data were used to identify the area of Commercial plantations. The spatial vector dataset was converted to a raster format before being integrated with the MLE forest cover raster dataset. The NPI dataset is produced by ABARES.
Google Earth Pro and Bing Maps	The most recent high-resolution imagery from Google Earth Pro and Bing Maps were used for validation of forest and non-forest allocation in areas where confidence in other datasets was low.
Qld 2007–2016 Land Clearing dataset	This dataset is produced by the Queensland government for the purposes of tracking vegetation clearing in the state. It was used by the NFI to identify and classify as non-forest cleared areas that would otherwise have been incorrectly reported as forest in SOFR 2018.
ACT 2016 Vegetation Map	This spatial vegetation dataset, including forest cover, was provided by the Australian Capital Territory government for use in SOFR 2018.

Western Australia South West Forest Management Area dataset	This spatial forest cover dataset was provided by the Western Australia government for use in SOFR 2018. The dataset covers only the south-west region of the state.
Tasmania 2016 Forest Cover	This statewide forest cover dataset was provided by the Tasmanian government for use in SOFR 2018.
Victoria SOFR 2013 Forest Cover dataset	This spatial forest cover dataset (developed for the Victorian SOFR 2013) was provided by the Victorian government for use in the national SOFR 2018. It was developed for Victoria's SOFR 2013 from Landsat satellite data using Victoria's Machine Learning Algorithm.
NSW CRAFTI Upper and Lower North East (1999), Eden CRA Forest Ecosystems (1998) and Southern CRA Forest Ecosystems (2000)	These datasets, developed for the Comprehensive Regional Assessment (CRA) process, were used to delineate and mask naturally treeless areas (grasslands, heathlands and shrublands). Such areas are often classified as tree cover by remote-sensing datasets including SLATS and NGGI.

CLUM, *Catchment Scale Land Use of Australia – Update September 2017*[1]; CRA, Comprehensive Regional Assessment; CRAFTI, Comprehensive Regional Assessment Aerial Photographic Interpretation; FPC, Foliage Projective Cover; MLE, Multiple Lines of Evidence; NFI, National Forest Inventory; NGGI, National Greenhouse Gas Inventory; NPI, National Plantation Inventory; NIR, National Inventory Report; SPOT, Satellite Pour l'Observation de la Terre.
Note: Forest area, cover and extent are used interchangeably in this work.

Table 2: Data sources for forest area attribution

Parameter	Data sources	Notes

Forest type	• NPI 2016, then
	• TASVEG,
	or ACT 2016 Vegetation Map, then
	• NVIS 5.0 or
	Forests of Australia (2013) v2.0, as used for SOFR 2013
		A hierarchical approach was used to derive and allocate NFI forest types to the NFI 2016 forest cover dataset in the following order as applicable:
		1. the NPI 2016 spatial dataset was used to allocate types to Commercial plantations
		2. native forest types were allocated as follows:
		  – Tasmania, from floristics information in TASVEG
		  – ACT, from floristics information in the ACT 2016 Vegetation Map
		  – for Victoria, and NSW Lower and Upper North East RFA regions, from SOFR 2013 forest cover dataset 'Forests of Australia (2013) v2' (and from NVIS 5.0 where appropriate information could not be derived from SOFR 2013 dataset)
		  – for all other states and territories, from Major Vegetation Subgroup (MVS), Major Vegetation Group (MVG), Level V and Level VI categories of the NVIS 5.0 dataset.
		3. where forest types could not be allocated from the above sources, forest types used in the SOFR 2013 forest cover dataset were allocated
		4. any remaining native forest areas not allocated a forest type were allocated as "Other native forest". Planted forest areas not allocated a type were also allocated as "Other forest".

Forest tenure	• Jurisdictional land tenure datasets from relevant land titles registries and spatial data agencies • National land tenure data from PSMA Australia Limited • Australian Government Department of Defence • Tenure of Australia's Forests (2013) v2.0, as used for SOFR 2013	The process to allocate tenure categories to the NFI 2016 forest cover dataset used a combination of national tenure information from PSMA, data from the Australian Government Department of Defence, and data from all jurisdictions except South Australia. Data sources used for each jurisdiction were prioritised based on the assessed accuracy of each dataset.
Forest height and cover	• NVIS 5.0 • ACT 2016 Vegetation Map • Tasmania 2016 Forest Cover • SOFR 2013	

NFI, National Forest Inventory; NPI, National Plantation Inventory; NVIS, National Vegetation Information System; PSMA, PSMA Australia Ltd; TASVEG, Tasmanian Vegetation Monitoring and Mapping Program.

References:

1. DoEE (Department of the Environment and Energy) (2017c). *National Inventory Report 2015. Volume 2.* DoEE, Canberra.

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[1] data.gov.au/dataset/catchment-scale-land-use-of-australia-update-2017

2. Mutendeudzi M, Read S, Howell C, Davey S and Clancy T (2013b). *A 'Multiple Lines of Evidence' approach to Australia's forest cover estimate.* In: Managing our Forests into the 21st Century, Proceedings of the Institute of Foresters of Australia Conference, Canberra, 7–11 April 2013, Institute of Foresters of Australia, Canberra

3. Scarth P, Armston J and Danaher T (2008). *On the relationship between crown cover, foliage projective cover and leaf area index.* Proceedings of 14th Australasian Remote Sensing and Photogrammetry Conference, Darwin.