

Detailed lineage on the development of state and territory datasets for *Forests of Australia (2018)* dataset using the Multiple Lines of Evidence (MLE) method for publication in the *Australia's State of the Forests Report 2018*.

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.

For each state or territory, intersection of the Forests of Australia (2013) v2.0 dataset with a forest cover dataset supplied by the jurisdiction, and with other available and appropriate independent forest cover datasets, identified:

- High confidence areas – areas where all the examined datasets agreed with the Forests of Australia (2013) v2.0 dataset that the areas were forest or non-forest. No further assessment was required for these areas.
- Moderate confidence areas – areas where the Forests of Australia (2013) v2.0 dataset agreed with the forest cover dataset supplied by state or territory, and with external or independent datasets, that the areas were forest or non-forest. These areas were identified as potential errors and needed further analysis in order to determine the correct allocation (forest or non-forest). The required analyses and validation were conducted by ABARES, in consultation with relevant state and territory agencies, using various ancillary data including high-resolution imagery such as Bing Maps and Google Earth Pro.
- Low confidence areas – areas where the Forests of Australia (2013) v2.0 dataset disagreed with the forest cover dataset supplied by state or territory, and with external or independent datasets, that the areas were forest or non-forest. All such areas were identified as potential errors and needed further analysis in order to determine the correct allocation (forest or non-forest). The required analyses and validation were conducted by ABARES, in consultation with relevant state and territory agencies, using various ancillary data including high-resolution imagery such as Bing Maps and Google Earth Pro.

External or independent datasets used include:

1. State-wide Land and Tree Study (SLATS) dataset based on data collected by the SPOT5 satellite. This dataset was available for New South Wales and the Australian Capital Territory. Foliage Projective Cover (FPC) values of 11 or greater (equivalent to crown cover 20% or greater) were considered as forest candidates in this SLATS dataset. The National Vegetation Information System (NVIS) version 5.0 dataset was used to identify areas in this SLATS dataset that met the height requirements of the forest definition used by the National Forest Inventory (NFI).
2. State-wide Land and Tree Study (SLATS) dataset is based on data collected by the Landsat satellite. This dataset was available for Queensland only. Foliage Projective Cover (FPC) values of 11 or greater (equivalent to crown cover 20% or greater) were considered as forest candidates in this SLATS dataset. The National Vegetation Information System (NVIS) version 5.0 dataset was used to identify areas in this SLATS dataset that met the height requirements of the forest definition used by the National Forest Inventory.
3. National Greenhouse Gas Inventory (NGGI) dataset based on data collected by the Landsat satellite. This dataset was produced by Department of the Environment and Energy for carbon accounting and was available across

Australia. The dataset uses a similar definition of forest to the one used by the NFI. However, the NCAS dataset also includes a minimum patch size (0.25 ha) whereas the NFI dataset does not.

4. Persistent Green-Vegetation Fraction (PGVF) dataset is based on data collected by the Landsat satellite. The dataset was produced by the Terrestrial Ecosystem Research Network (TERN) for mapping persistent green cover across Australia.

Validation assessment results were incorporated to give improved and high-confidence forest cover datasets for each state or territory.

Look-up tables translating the state or territory forest cover data to NFI forest types were used where provided. Where this information was not provided, it was derived by ABARES from translating Levels 5 and 6 of the National Vegetation Information System (NVIS) version 5.0 attribute information to NFI forest types.

All input datasets were converted to 100m rasters (ESRI GRID format), aligning with relevant standard NFI state or territory masks (also known as NFI SNAP grids), in Albers projection. Where the input dataset was in polygon format, the **Polygon to Raster** tool was used to convert the polygon dataset to raster format, using the **Maximum_Combined_Area** option.

MLE input datasets to derive SOFR 2018 forest cover for Australian Capital Territory

The following four datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. ACT 2016 Vegetation Map – this is the dataset provided by the Australian Capital Territory for use in SOFR 2018
3. NSW SPOT5 SLATS (2012)
4. NGGI (2016)

Areas of high confidence in forest or non-forest allocation in the territory's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation in the territory's dataset were analysed and validated by ABARES, in consultation with staff from the ACT Environment, Planning and Sustainable Development Directorate, using high-resolution imagery from Bing Maps and Google Earth Pro.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in the Australian Capital Territory.

MLE input datasets to derive SOFR 2018 forest cover for New South Wales

The following three datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. NSW SPOT5 SLATS Foliage Projective Cover (2012) - this is the dataset provided by the New South Wales for use in SOFR 2018
3. NGGI (2016)

Areas of high confidence in forest or non-forest allocation in the state's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation in the state's dataset were analysed and validated by ABARES, in consultation with staff from NSW Office of Environment and Heritage and NSW Forest Corporation, using high-resolution imagery from Bing Maps and Google Earth Pro. CRA datasets (Upper and Lower North East CRAFTI, Eden and Southern) were used as ancillary datasets – to identify and mask out ecosystems not capable of supporting forest cover, including: natural grasslands, shrub-lands, heathlands, marshes/wetlands and sedge/herb lands.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in New South Wales.

MLE input datasets to derive SOFR 2018 forest cover for Victoria

The following three datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. Victoria SOFR (2013) forest cover dataset - this is the dataset provided by the this is the dataset provided by Victoria for use in SOFR 2018
3. NGGI (2016)

Areas of high confidence in forest or non-forest allocation in the state's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation in the state's dataset were analysed and validated by ABARES, in consultation with staff from Department of Environment, Land, Water and Planning, using high-resolution imagery from Bing Maps and Google Earth Pro. CRA datasets (East Gippsland, Gippsland, Central Highlands, North East and West Victoria) were used as ancillary datasets – to identify and mask out ecosystems not capable of supporting forest cover, including: natural grasslands, shrub-lands, heathlands, marshes/wetlands and sedge/herb lands.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in Victoria.

MLE input datasets to derive SOFR 2018 forest cover for Tasmania

The following three datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. Tasmania 2016 forest cover dataset - this is the dataset provided by Tasmania for use in SOFR 2018
3. NGGI (2016)

Areas of high confidence in forest or non-forest allocation in the state's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation in the state's dataset were analysed and validated by ABARES, in consultation with staff from Sustainable Timber Tasmania (formerly Forestry Tasmania), using high-resolution imagery from Bing Maps and Google Earth Pro. The TASVEG 3.0 dataset was used as an ancillary dataset – to identify and mask out ecosystems not capable of supporting forest cover, including: natural grasslands, shrub-lands, heathlands, marshes/wetlands and sedge/herb lands.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in Tasmania.

MLE input datasets to derive SOFR 2018 forest cover for South Australia

The following three datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. NGGI (2016)
3. Persistent Green-Vegetation Fraction (PGVF)

Areas of high confidence in forest or non-forest allocation in the state's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation in the state's dataset were analysed and validated by ABARES, in consultation with staff from Department of Environment and Natural Resources, using high-resolution imagery from Bing Maps and Google Earth Pro. The NVIS 5.0 dataset was used as an ancillary dataset – to identify and mask out ecosystems not capable of supporting forest cover,

including natural grasslands, shrub-lands, heathlands, marshes/wetlands and sedge/herb lands.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in South Australia.

MLE input datasets to derive SOFR 2018 forest cover for Western Australia

The following 3 datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. WA Forest Management Plan Area (2017) forest cover dataset – this is the dataset provided by the Western Australia for use in SOFR 2018. The dataset is limited to the south west of Western Australia.
3. NNGI (2016)
4. Persistent Green-Vegetation Fraction (PGVF)

Areas of high confidence in forest or non-forest allocation in the state's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation in the state's dataset were analysed and validated by ABARES, in consultation with staff from Department of Biodiversity, Parks and Attractions, using high-resolution imagery from Bing Maps and Google Earth Pro. The NVIS 5.0 dataset was used as an ancillary dataset – to identify and mask out ecosystems not capable of supporting forest cover, including: natural grasslands, shrub-lands, heathlands, marshes/wetlands and sedge/herb lands.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in Western Australia.

MLE input datasets to derive SOFR 2018 forest cover for Northern Territory

The following 3 datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. NNGI (2016)
3. Persistent Green-Vegetation Fraction (PGVF)

Areas of high confidence in forest or non-forest allocation in the state's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation in the state's dataset were analysed and validated by ABARES, in consultation with staff from Department of Environment and Natural Resources, using high-resolution imagery from Bing Maps and Google Earth Pro. The NVIS 5.0 dataset was used as an ancillary dataset – to identify and mask out ecosystems not capable of supporting forest cover, including: natural grasslands, shrub-lands, heathlands, marshes/wetlands and sedge/herb lands.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in Northern Territory.

MLE input datasets to derive SOFR 2018 forest cover for Queensland

The following 4 datasets were intersected as part of the MLE method:

1. Forests of Australia (2013) v2.0
2. QLD SLATS Foliage Projective Cover (2014) - this is the dataset provided by Queensland for use in SOFR 2018
3. NNGI 2016

Areas of high confidence in forest or non-forest allocation in the state's dataset were not assessed further. Areas of moderate or low confidence in forest or non-forest allocation

in the state's dataset were analysed and validated by ABARES, in consultation with staff from Department of Environment and Science, using high-resolution imagery from Bing Maps and Google Earth Pro. The NVIS 5.0 dataset was used as an ancillary dataset – to identify and mask out ecosystems not capable of supporting forest cover, including: natural grasslands, shrub-lands, heathlands, marshes/wetlands and sedge/herb lands. In addition, the Queensland 2007-2016 Land Clearing dataset was used to identify and classify as non-forest, cleared areas that had been incorrectly classified by the MLE process.

The validated dataset was then combined with the National Plantation Inventory (NPI) spatial dataset (2016) to capture plantation areas in Queensland.

Forests of Australia (2018) – All the validated state and territory datasets described above were merged to create a national dataset. The final step involved using the catchment-scale land-use dataset to identify and mask out (allocate as non-forest) areas in the national forest cover dataset that have the following land-uses: cropping, horticulture, irrigation, residential, industrial and utilities. This last step was achieved using the Catchment scale Land Use and Management (CLUM) dataset (2017), also produced by ABARES. The output from these processes was the Forests of Australia (2018) dataset.