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| Title | NSW Woody Vegetation Extent 2011 |
| Alternative title(s) | NSW Woody Extent 5m |
| Abstract | <p>The NSW 5m Woody Extent is a state-wide binary classification of woody vegetation derived from multitemporal 5m SPOT-5 satellite imagery. The product broadly identifies isolated tree crowns as well as contiguous forest at a 5m resolution.</p> <p>This latest map of woody vegetation extent for NSW is the highest detailed to date. It shows the location and extent of woody vegetation in NSW for the year 2011. It can be used to identify small features such as paddock trees and trees in scattered woodlands, to the largest expanses of forest in the state. It is intended for use in non-urban environments and its accuracy for urban environments has not been assessed.</p> <p>The dataset is also used as a spatial constraint for a seamless map of woody foliage projection cover (FPC). FPC is the fraction of the ground that is obscured by green leaf, and is a measure of density. The FPC dataset is delivered as a separate map to the woody extent (although it is constrained by it), and it can also be requested from the OEH data broker.</p> <p>The woody extent product was derived from user-driven thresholds on an index of woody probability. The probability was calculated from a binomial logistic regression model on multi-temporal data. The model utilised the statistics from SPOT-5 imagery over 2008-2012 and referenced over 26000 training points. Comprehensive manual corrections were also performed throughout 2013-2014 at a scale of 1:15000.</p> <p>The dataset is provided in 8-bit raster format with the following attributes values: 1 = Woody 0 = Non-Woody 255 = null (either outside the NSW boundary or a perennial water feature)</p> <p>Overall state accuracy is recorded at 90.1% when compared to Lidar datasets (see lineage for more information), and 88% when compared to 6670 visually derived validation points. Although this dataset has undergone extensive manual corrections, the accuracy for specific regions may vary considerably.</p> <p>http://www.auscover.org.au/xwiki/bin/view/Product+pages/nsw+5m+woody+extent+and+fpc</p> |
| Resource locator | |
| Data Quality Statement | <p>Name: Data Quality Statement</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>DQS - NSW Woody Vegetation Extent</p> <p>Function: download</p> |
| Woody Vegetation Extent 2011 | <p>Name: Woody Vegetation Extent 2011</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>Download Information file (Contains FTP and info URLs)</p> <p>Function: download</p> |
| FTP Site | <p>Name: FTP Site</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>FTP Link to download Raster Tiled Data</p> <p>Function: download</p> |
| Unique resource identifier | |
| Code | aa1117a9-9d03-4cfb-82d5-c31b8c1e14bf |
| Presentation form | Map digital |
| Edition | 1 |

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| Dataset language | English |
| Metadata standard | |
| Name | ISO 19115 |
| Edition | 2016 |
| Dataset URI | https://datasets.seed.nsw.gov.au/dataset/aa1117a9-9d03-4cfb-82d5-c31b8c1e14bf |
| Purpose | This product was commissioned as a key base map for the vegetation mapping team of the NSW Office of Environment Heritage Native Vegetation Information Science Branch and as a powerful spatial constraint for the state-wide map of Foliage Projection Cover produced by the OEH Remote Sensing and Analysis Unit. It is also released as a stand-alone product as part of the state-wide regional scale vegetation mapping project for a number of user functions such as habitat connectivity analysis, bushfire modelling, catchment management, property planning and local government planning. |
| Status | Completed |
| Spatial representation type | grid |
| Spatial reference system | |
| Code identifying the spatial reference system | 4283 |
| Spatial resolution | 5 m |
| Additional information source | <p>The product is available either as a seamless NSW mosaic (17 GB) or as a collection of subset tiles that intersect with a region of interest.</p> <p>The maps may be requested through the Office of Environment and Heritage's Spatial Data Online catalogue: http://mapdata.environment.nsw.gov.au. Search for woody vegetation and fpc.</p> <p>For data access queries contact the data broker. data.broker@environment.nsw.gov.au</p> <p>See lineage below for summary of production method. Official report/paper pending for description of methods and validation.</p> <p>External Data Link:</p> <p>http://www.auscover.org.au/xwiki/bin/view/Product+pages/nsw+5m+woody+extent+and+fpc</p> |
| Topic category | |

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| Keyword set | |
| keyword value | canopy woody NSW 5m vegetation satellite |
| Originating controlled vocabulary | |
| Title | ANZLIC Search Words |
| Reference date | 2008-05-16 |
| Geographic location | |
| West bounding longitude | 141 |
| East bounding longitude | 154 |
| North bounding latitude | -38 |
| South bounding latitude | -28 |
| Vertical extent information | |
| Minimum value | -100 |
| Maximum value | 2228 |
| Coordinate reference system | |
| Authority code | urn:ogc:def:cs:EPSG:: |
| Code identifying the coordinate reference system | 5711 |
| Temporal extent | |
| Begin position | 2011-01-01 |
| End position | N/A |
| Dataset reference date | |
| Resource maintenance | |
| Maintenance and update frequency | As needed |
| Contact info | |
| Contact position | Data Broker |
| Organisation name | NSW Department of Climate Change, Energy, the Environment and Water |
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| Responsible party role | pointOfContact |

Lineage

LINEAGE

The image data used: The source data was SPOT5 High Resolution Geometric (HRG) satellite imagery. It consists of 4 multispectral bands (10 m pixels), and a panchromatic band (2.5 m pixels). A time series of one image per year for the period 2008 to 2011 was acquired during dry periods where the contrast between woody vegetation and the ground cover is high. A total 1256 images were used. The images were registered with ground control. The multispectral imagery was corrected for atmospheric and bi-directional reflectance effects and sharpened to 5 m pixels using the panchromatic imagery. The images were masked for cloud, cloud shadow, topographic shadow, and water.

Detecting woody vegetation in the images: An estimate of foliage projective cover (FPC) was derived for every clear pixel in every image. FPC is the fraction of the ground that is obscured by green leaf. This required a multiple linear regression model that related the multi-spectral reflectance to a reference data set of FPC. Each pixel contained up to 5 observations of FPC and reflectance over time.

The probability of a pixel containing woody vegetation was determined using a binomial logistic regression model. The model parameters were the mean FPC, mean red reflectance, variation in FPC over time, and the climate variable vapour pressure deficit. The model was trained using 25930 observations of woody vegetation presence or absence. These points were interpreted from ADS40 aerial imagery where available (0.5 m pixels) and SPOT5 HRG panchromatic images (2.5 m pixels).

Mapping woody vegetation: Woody vegetation extent was mapped by applying a threshold to the probability images, with further editing by trained analysts. The comprehensive manual corrections were performed throughout 2013-2014 at a scale of 1:15000.

Assessing the accuracy: Two comparisons with independently-derived datasets of woody-vegetation extent were performed. The first used reference data derived from airborne Lidar collected across a range of vegetation formations, that had been related to data collected on the ground. 90.1% overall accuracy was obtained, although over half the errors were identified as being on the edges between woody and non-woody regions that may partly be caused by differences in positioning between the SPOT images and lidar data. The range was from 85.3% in the hunter to 94.5% in the South East. The second used image-interpreted points of woody vegetation presence or absence. The overall accuracy was 88%, which ranged from 77.5% in Western to 95.8% in the North Coast. Validation of the FPC values is forthcoming.

KNOWN CAVEATS

The data set was derived using multi-temporal SPOT-5 data spanning 2008-2012 (not ADS40)

Manual edits of the product were performed using a SPOT-5 near-natural mosaic of the 2011 acquisition (not ADS40)

Current estimate of overall accuracy of the manually screened product is 87.1%. This was performed on 75% of the state (the extent of area edited as of May 2014). This measure will be updated upon completion.

Any errors over cultivated land will generally be errors of omission of isolated crowns rather than commission errors.

No confidence should be placed over any non-native woody plantations in this data set. The modelling prediction over non-native woody was particularly erroneous since woody vegetation was often absent in at least one epoch (the model required 4 epochs to predict woody). A woody classification of a non-native contiguous stand was either included or excluded depending on which outcome required the least manual correction.

Visually, error is generally higher over wetland environments more than other native areas. And of this error, omission error is more likely.

Generally error is spatially variable and is dependent mostly on seasonal spectral variation more than a correlation with any environmental variable i.e, areas with similar environmental variables may have different error margins.

Less confidence should be placed in the classification in the far west of NSW. The visual identification of woody/non-woody is problematic given the small size of woody vegetation and the abundance of large chenopods.

In summary care should be taken when interpreting the maps. Incorrect classification is most likely to occur where it is difficult to distinguish trees, greater than two metres in height, from other types of vegetation. Such vegetation includes sparse woodlands, low shrubs, chenopods, heath, wetlands, and irrigated pastures and crops. Also, woody vegetation is only detected about half of the time when the foliage cover within a pixel is less than 20%.

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| Scope | dataset |
| DQ Completeness Commission | |
| Effective date | 2016-06-01 |
| Explanation | Dataset buffers the NSW border by an extra 1.5km. |
| DQ Conceptual Consistency | |
| Effective date | 2015-04-02 |
| Explanation | Contains the following cell values only: 0,1,255 |
| DQ Topological Consistency | |
| Effective date | 2015-04-02 |
| Explanation | No known topological errors. |
| DQ Absolute External Positional Accuracy | |
| Effective date | 2015-04-02 |
| Explanation | The classification was derived from SPOT-5 10m imagery pan-sharpened to 5m. Positional accuracy dependent on raw imagery rectification performed by Geoimage Pty Ltd and the subsequent pan-sharpening by the Remote Sensing and Land Assessment Unit (OEH). |
| DQ Non Quantitative Attribute Correctness | |
| Effective date | 2015-04-02 |
| Explanation | <p>We conducted two comparisons with independent observations of woody vegetation extent. The first comparison used independently-derived, fine-detailed maps of woody-vegetation extent derived from airborne Lidar surveys. The state-wide map of extent had an overall accuracy of 90.1%.</p> <p>The second comparison used 6670 image-interpreted points of woody vegetation presence or absence. The points were gathered from images with 2.5 m pixels. The overall accuracy was 88% . The spatial variation in accuracy across the state, reported by Local Land Service region, is also listed below:</p> <p>Local Land service Points Lidar North Coast 95.80% 93.60% Northern Tablelands 91.80% 89.00% South East 91.60% 94.50% Central Tablelands 91.00% 86.80% Greater Sydney 90.60% 89.10% Central West 89.80% 88.30% Riverina 89.00% 93.00% Hunter 88.70% 85.30% North West 88.30% 89.00% Murray 84.80% 90.30% Western 77.50% 88.60%</p> |
| Responsible party | |
| Contact position | Data Broker |
| Organisation name | NSW Department of Climate Change, Energy, the Environment and Water |
| Telephone number | 131555 |
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| Web address | https://www.nsw.gov.au/departments-and-agencies/dcceew |
| Responsible party role | pointOfContact |

Metadata point of contact

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| Metadata date | 2024-02-26T12:55:07.481356 |
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| Metadata language |
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