Title	NSW eastern forest soil condition: Spatio-temporal data cube maps
Alternative title(s)	Determining baselines, drivers and trends of soil health and stability in NSW forests – Regional Forest Agreement regions: Spatio-temporal data cube maps
Abstract	This dataset created by the University of Sydney, includes time series digital soil map products of soil organic carbon (SOC) between January 1990 and December 2020 for the Regional Forest Agreement regions of eastern NSW. Modelling was completed using a data cube platform incorporating machine learning space-time framework and geospatial technologies. Products provide estimates of SOC concentrations and associated trends through time. Also important covariates required to drive this spatio-temporal modelling are identified using the Recursive Feature Elimination algorithm (RFE), which including a range of predictors that vary in space, time and space and time. Full description of the digital soil maps and methods are presented in: Moyce MC, Gray JM, Wilson BR, Jenkins BR, Young MA, Ugbaje SU, Bishop TFA, Yang X, Henderson LE, Milford HB, Tulau MJ, 2021. *Determining baselines, drivers and trends of soil health and stability in New South Wales forests: NSW Forest Monitoring & Improvement Program*, Final report v1.1 for NSW Natural Resources Commission by NSW Department of Planning, Industry and Environment and University of Sydney. The metadata's *data packages* section includes project scripts and code, final project report and an external Cloudstor link to download the predicted SOC map products,

Resource locator

Data Quality Statement	Name: Data Quality Statement Protocol: WWW:DOWNLOAD-1.0-http--download Description: Data quality statement for NSW eastern forest soil condition: Spatio-temporal data cube maps Function: download
Eastern forest data cube maps dataset	Name: Eastern forest data cube maps dataset Protocol: WWW:DOWNLOAD-1.0-http--download Description: Visit Cloudstor to download the Tif maps Function: download
Spatio-temporal data cube code/scripts	Name: Spatio-temporal data cube code/scripts Protocol: WWW:DOWNLOAD-1.0-http--download Description: Download the zipped package of dataset's codes/scripts Function: download
NSW eastern forest soil condition report v1.1	Name: NSW eastern forest soil condition report v1.1 Protocol: WWW:DOWNLOAD-1.0-http--download Description: Download the technical report: Determining baselines, drivers and trends of soil health and stability in NSW forests – RFA regions. Function: download

Unique resource identifier

Code	8e9b2899-8a58-4d6e-9487-48f83b4b7b7e

Presentation

Map digital

form	
Edition	version 1
Dataset language	English

Metadata standard

Name	ISO 19115
Edition	2016

Dataset URI	https://datasets.seed.nsw.gov.au/dataset/8e9b2899-8a58-4d6e-9487-48f83b4b7b7e
Purpose	For monitoring and managing soil condition in eastern NSW forests into the future
Status	Completed
Spatial representation type	grid

Spatial reference system

Code identifying the spatial reference system	4283

Spatial resolution	300 m
Additional information source	For technical information or support on the Data Cube and predicted OC maps, please contact: Thomas Bishop University of Sydney thomas.bishop@sydney.edu.au

Topic category

Keyword set

keyword value	SOIL FORESTS CLIMATE-AND-WEATHER-Climate-change LAND-Use SOIL-Chemistry

Originating controlled vocabulary

Title	ANZLIC Search Words
Reference date	2008-05-16

Geographic location

West bounding longitude	148
East bounding longitude	154
North bounding latitude	-37.7

South bounding latitude	-28
NSW Place Name	Regional Forest Agreement Regions of eastern NSW

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	2001-01-01
End position	N/A

Dataset reference date

Resource maintenance

Maintenance and update frequency	As needed
Contact info	
Contact position	Data Broker
Organisation name	NSW Natural Resources Commission
Telephone number	131555
Facsimile number	02 9995 5999
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nrc.nsw.gov.au/
Responsible party role	pointOfContact

Lineage

Soil data comprised approximately 1800 profile points derived from SALIS, comprising data mainly from NSW soil survey program and 2008 -09 Monitoring Evaluation and Reporting (MER) program. Modelling established relationships of soil indicators with 10 environmental variables selected by a recursive feature elimination algorithm (RFE).

All time-varying covariates (NDVI and climate variables) were aggregated to monthly values. Since the effect of these covariates on soil health dynamics depends on current and past conditions, a decay function weighting algorithm was applied to aggregate sixty months (5 years) of the covariate timeseries prior to when the soil profile was sampled. The algorithm attaches more weight to the most recent observations.

Digital soil mapping used quantile random forest modelling techniques in R statistical program framework. Resolution of products were 300m. Calibration involved the tuning of the number of predictors sampled for splitting at each node (mtry) of the RF model using a 10-fold cross-validation approach. Validation of maps was achieved using a 20% validation dataset initially separated from the 80% training dataset.

Methods are described fully in the accompanying Technical Report (Moyce et al. 2021).

Limitations on public access

Scope	dataset

DQ Completeness Commission

Effective date	2021-06-30
Explanation	Covers area within Regional Forest Agreement regions that has woody vegetation as mapped in NSW 2008 woody vegetation layer.

DQ Completeness Omission

Effective date	2021-06-30
Explanation	Did not include areas with non woody vegetation and those outside of NSW RFA regions.

DQ Conceptual Consistency

Effective date	2021-06-30
Explanation	Imperfect coverage of all environmental regimes in study area, ie, insufficient soil data in some areas of covariate space which has a spatial and temporal dimension. Potential limitations due to assumption that changes in NDVI through time and space represent different management regimes and impact of bushfire on soil carbon.

DQ Topological Consistency

Effective date	2021-06-30

DQ Absolute External Positional Accuracy

Effective date	2021-06-30
Explanation	The models had a Lin’s concordance correlation coefficient of 0.38 when independently validated at the point support. It is expected that the quality of predictions is slightly better at the 300 m spatial support used for predictions. Due to the small number of samples used for modelling since 2010 predictions for this period were not validated and should be treated with caution.

DQ Non Quantitative Attribute Correctness

Effective date	2021-06-30
Explanation	The authors have confidence in the broad spatial (300m + spatial resolution) and temporal (annual change) trends in the predictions for the period before 2010 when more observations were available.

Responsible party

Contact position	Data Broker
Organisation name	NSW Natural Resources Commission
Telephone number	131555
Facsimile number	02 9995 5999
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nrc.nsw.gov.au/
Responsible party role	pointOfContact

Metadata point of contact

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Responsible party role	pointOfContact

Metadata date

2024-02-26T13:02:59.731745

Metadata language