

Title	Digital soil maps for key soil properties over New South Wales, version 2.0
Abstract	Digital soil maps (DSMs) are prepared through quantitative modelling techniques that are based on relationships between soil attributes and the environment. DSMs are presented over NSW for a range of key soil properties, including soil organic carbon (SOC), pH, cation exchange capacity, sum-of-bases, available phosphorous, bulk density, clay, silt and sand (total and fine). The maps are at 100 m spatial resolution and cover ten soil depth intervals down to 2 m, consistent with widely used Australian and international systems. Random Forest decision tree modelling techniques were applied. Validation results for the maps indicate generally moderate to high performance and effectiveness. Maps of mean plus upper 95% and lower 5% prediction limits are available. The maps provide at least a useful first approximation of these soil properties across the State. The products are described more fully in the technical report: Gray (2023), Digital soil mapping of key soil properties over NSW, version 2.0 (76p). The report and raster layers can be downloaded through the NSW environmental data portal SEED (https://www.seed.nsw.gov.au/) and are also viewable through the DPE soil and landscape spatial viewer eSPADE (http://espade.environment.nsw.gov.au). All maps, including prediction limits and intervals, are also available through the DPE data broker.

Resource locator

Data Quality Statement	<p>Name: Data Quality Statement</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>Data quality statement for Digital soil maps for key soil properties over New South Wales, version 2.0</p> <p>Function: download</p>
Technical report, April 2023	<p>Name: Technical report, April 2023</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>Provides details on methodology, example maps with prediction intervals, validation results and discussion on the use of the products.</p> <p>Function: download</p>
SOC NSW DSMs to 1m	<p>Name: SOC NSW DSMs to 1m</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>Digital maps of soil organic carbon to 1 m, as concentration (%), mass (kg/m³) and stocks (t/ha)</p> <p>Function: download</p>
pH NSW DSMs to 2m	<p>Name: pH NSW DSMs to 2m</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>Digital soil maps of pH over NSW, multiple depths to 2 m</p> <p>Function: download</p>
Basic cations & CEC NSW DSMs	<p>Name: Basic cations & CEC NSW DSMs</p> <p>Protocol: WWW:DOWNLOAD-1.0-http--download</p> <p>Description:</p> <p>Digital soil maps for sum-of-bases and CEC over NSW, multiple depths to 2 m</p> <p>Function: download</p>
P bray NSW DSMs to 2m	<p>Name: P bray NSW DSMs to 2m</p>

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Digital soil maps of available P (bray) over NSW, multiple depths to 2 m

Function: download

[Bulk density NSW
DSMs to 30cm](#)

Name: Bulk density NSW DSMs to 30cm

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Digital soil maps of bulk density (t/m³) over NSW, several depths to 30 cm

Function: download

[Particle sizes
NSW DSMs to 2m](#)

Name: Particle sizes NSW DSMs to 2m

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Digital soil maps for sand, silt and clay over NSW, multiple depths to 2 m

Function: download

[DSM prediction
limits NSW all
properties](#)

Name: DSM prediction limits NSW all properties

Protocol: WWW:DOWNLOAD-1.0-http--download

Description:

Digital soil maps of prediction limits (upper 95% and lower 5%) for all key soil properties over NSW, 0-30 cm depth

Function: download

Unique resource identifier

Code 22f358d9-e59f-4b00-8089-99aaa8d0f7d0

Presentation form Model digital

Edition version 2.0

Dataset language English

Metadata standard

Name ISO 19115

Edition 2016

Dataset URI <https://datasets.seed.nsw.gov.au/dataset/22f358d9-e59f-4b00-8089-99aaa8d0f7d0>

Purpose For better understanding and management of NSW soils and broader environmental protection

Status Completed

Spatial representation type grid

Spatial reference system

Code identifying

the spatial
reference system

4283

Spatial
resolution

100 m

Topic category

Keyword set	
keyword value	SOIL SOIL-Chemistry SOIL-Physics
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	-37.7
South bounding latitude	-28
NSW Place Name	all 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	1985-01-01
End position	N/A
Dataset reference date	
Resource maintenance	
Maintenance and update frequency	Not planned
Contact info	
Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
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Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
Responsible party role	pointOfContact

Lineage The digital soil maps of the ten soil properties were prepared at multiple depth intervals down to 2 m. They were based on soil survey and laboratory data available over NSW. These data were randomly divided into training and validation subsets, at an approximate 80-20% ratio. Environmental covariate data representing the main soil forming factors (climate, geology, topography, land use/cover and age) were applied in the initial training models and final maps production. These were derived from environmental data grids covering the entire State with some site specific field survey data. The modelling and digital mapping applied Random Forest decision tree techniques, with 200 trees in each of 10 bootstrap runs. Upper 95% and lower 5% prediction limits of each map were also derived. Validation of the final digital soil maps was carried out using the independent validation data, with Lin's concordance correlation coefficient, RMSE, mean error and other standard statistical metrics.

Limitations on public access

Responsible party

Contact position	Data Broker
Organisation name	NSW Department of Climate Change, Energy, the Environment and Water
Telephone number	131555
Email address	data.broker@environment.nsw.gov.au
Web address	https://www.nsw.gov.au/departments-and-agencies/dcceew
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Metadata language