Soil and Landscape Grid of Australia

New fine resolution soil and landscape maps will assist a range of users to consider soils in their decision making

What is the Grid?

Led by CSIRO Land and Water scientists, DEWNR has been working with researchers and other state agencies to develop the new Soil and Landscape Grid of Australia.

The Grid is a series of soil and landscape attribute maps in fine resolution raster format (approximately 90 x 90 m pixels), depicting the 3-dimensional nature of soils in six depth ranges, down to 2 metres.

Attributes were chosen for their importance to key soil functions. For example: supporting and influencing plant growth; storing and allowing movement of water and nutrients; withstanding erosion and providing suitable conditions for various land uses.
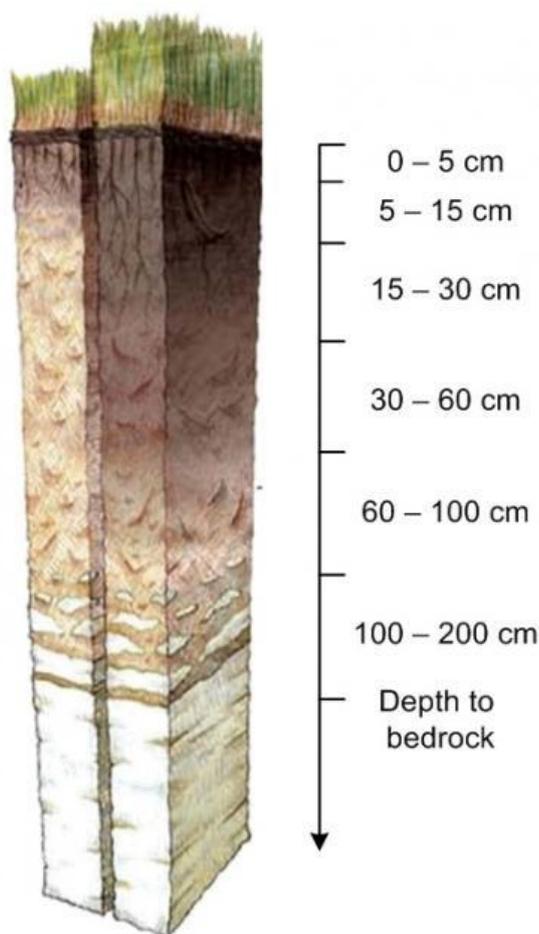
The Soil and Landscape Grid of Australia has been built to meet the standards of the GlobalSoilMap, an international collaboration to develop and share next generation soils information (Image: www.globalsoilmap.net)

The Grid has been developed through novel spatial modelling techniques, including methods that attempt to build on the knowledge contained in legacy polygon-based soil maps. Attributes are presented as 'expected values' (best estimates), as well as 5th and 95th percentile prediction limits to express uncertainty in the mapping.

The Grid provides a foundation for further interpretation and value-adding, and was designed to help support analysis and decision making across diverse fields – such as agriculture, land and water resource management, policy, land use planning, and research such as ecosystem modelling.

Why do we need new raster soil mapping?

South Australia's legacy polygon-based soil mapping (see NatureMaps > Soils) will retain its usefulness, particularly at regional scales when interpreted soils information is required on short timeframes.

Limitations in traditional polygon mapping arise from the difficulty in predicting soil conditions at a particular site, because the scale of mapping typically captures a number of associated soils (with varying properties) within each map unit.

The Grid presents raster-based soil information at a pixel size that can be applied at finer scales to estimate conditions at a site, or within a paddock or land parcel.

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How do I use the data?

Attributes represent raw functional properties of soils and landscapes. Users can apply data in different ways to suit their needs. In some cases this could mean using data in its raw form – for example inspecting maps of surface soil pH.

Examining spatial patterns and variability may also be useful in deciding where to do soil testing and monitoring.

For many applications, some additional interpretation is likely to be required. At the simpler end of the spectrum, by way of example, total plant-available water-holding capacity can be estimated by summing up values from a number of soil layers. With input from soils and other experts, more complex analyses are possible, for example to explore themes such as land use suitability, productivity, carbon storage, catchment water quality, species distributions, and all manner of soil-connected biophysical systems.

How do I obtain the data?

Users can Get the Data in a number of ways:

- Download files via the CSIRO Data Access Portal
- Import Web Coverage Services directly into GIS
- View and clip rasters via an online tool

Three types of soil attribute products are available:

- Australia-wide consistent modelling
- Disaggregation of legacy polygon soil mapping
- National layers that merge these two approaches

Further information

- DEWNR Contact (refer to Knowledge Coordination, Soil Information)
- www.csiro.au/soil-and-landscape-grid
- See the Grid animation
- Read the CSIRO fact sheet
- Files and Metadata on CSIRO Data Access Portal

South Australia's legacy soil mapping:
- View data on NatureMaps (→ Soils)
- Read more about soil mapping in South Australia
- Interpreting soil profile information
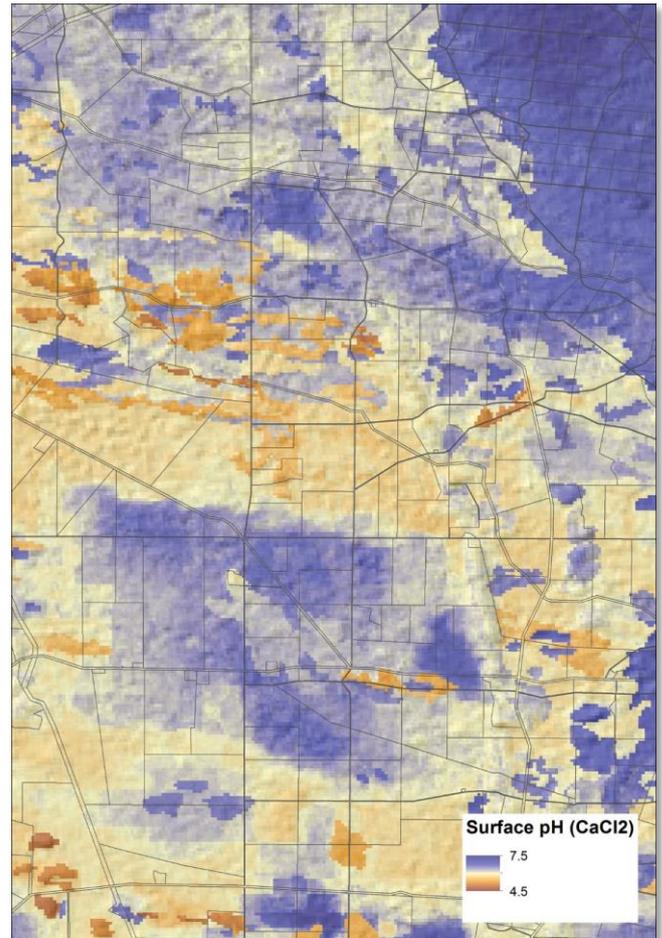
New fine resolution maps will support better on-ground decisions. For example targeting lime applications to maintain productive soils, and considering soil conditions in revegetation or habitat restoration.

What is the future of the Grid?

There is a worldwide consensus-move towards more efficient and cost-effective digital soil mapping (DSM) techniques. The Grid provides us with a comprehensive first view (version 1) of this futuristic soils mapping, in a form that can be readily integrated by a range of users and disciplines. As our knowledge of soil grows, as more soil site data are gathered over time and DSM methods evolve, we can expect the reliability and number of applications for the Grid to increase over time.

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