

# Subsoil carbonate

**Soil carbonates originate as wind-blown materials, coastal shell deposits, sedimentary limestone or calcareous bedrock**

**Subsoil carbonate** refers to subsoil layers that contain carbonates of calcium, and to a lesser extent magnesium, which are widespread across South Australia's agricultural districts particularly below 400 mm annual rainfall. *Subsoil carbonate* can occur as finely divided segregations intimately mixed with the sand and clay particles of the soil, as hard nodules or concretions (commonly called rubble), or as sheet rock or calcareous hardpan (commonly called calcrete). Fine subsoil carbonates reduce the availability of key plant nutrients, and when in a clayey matrix are often associated with high pH, sodicity and boron concentrations. Crops such as lupins perform poorly if there is any carbonate in the upper 30 cm. Hard carbonates reduce available waterholding capacity, and in the case of calcrete, limit rootzone depth.

## Land assessment in southern South Australia

The nature, depth to, and concentration of carbonates are routinely assessed during field mapping work. The presence of carbonates is determined by the strength of effervescence resulting from the application of 1 M hydrochloric (HCl) acid. Area statistics for *Subsoil carbonate* highlight the depth to very highly calcareous material (strong reaction to 1 M HCl) where major limitations occur with respect to nutrient availability, plant growth, and herbicide persistence and efficacy.

Soil properties can vary across the landscape in a subtle or dramatic fashion. [Mapping at a regional scale](#) is not able to display this level of variability, however proportions of each *Subsoil carbonate* class (e.g. KB1, KB2, etc.) have been estimated for each map unit.

Further information can be found in [Assessing Agricultural Land](#) (Maschmedt 2002).



Calcareous subsoil at 30 cm depth

## Area statistics

Depth to very highly calcareous material (strong reaction to 1 M HCl)	Area	Cleared land	Class*
More than 60 cm	33.69%	35.46%	KB1
30–60 cm	29.68%	31.46%	KB2
Less than 30 cm	35.20%	31.38%	KB3
Not applicable	1.42%	1.70%	KBX
TOTAL HECTARES	15,765,460	10,439,300	

\* The letters 'KB' denotes classes that are specific to *Subsoil carbonate*

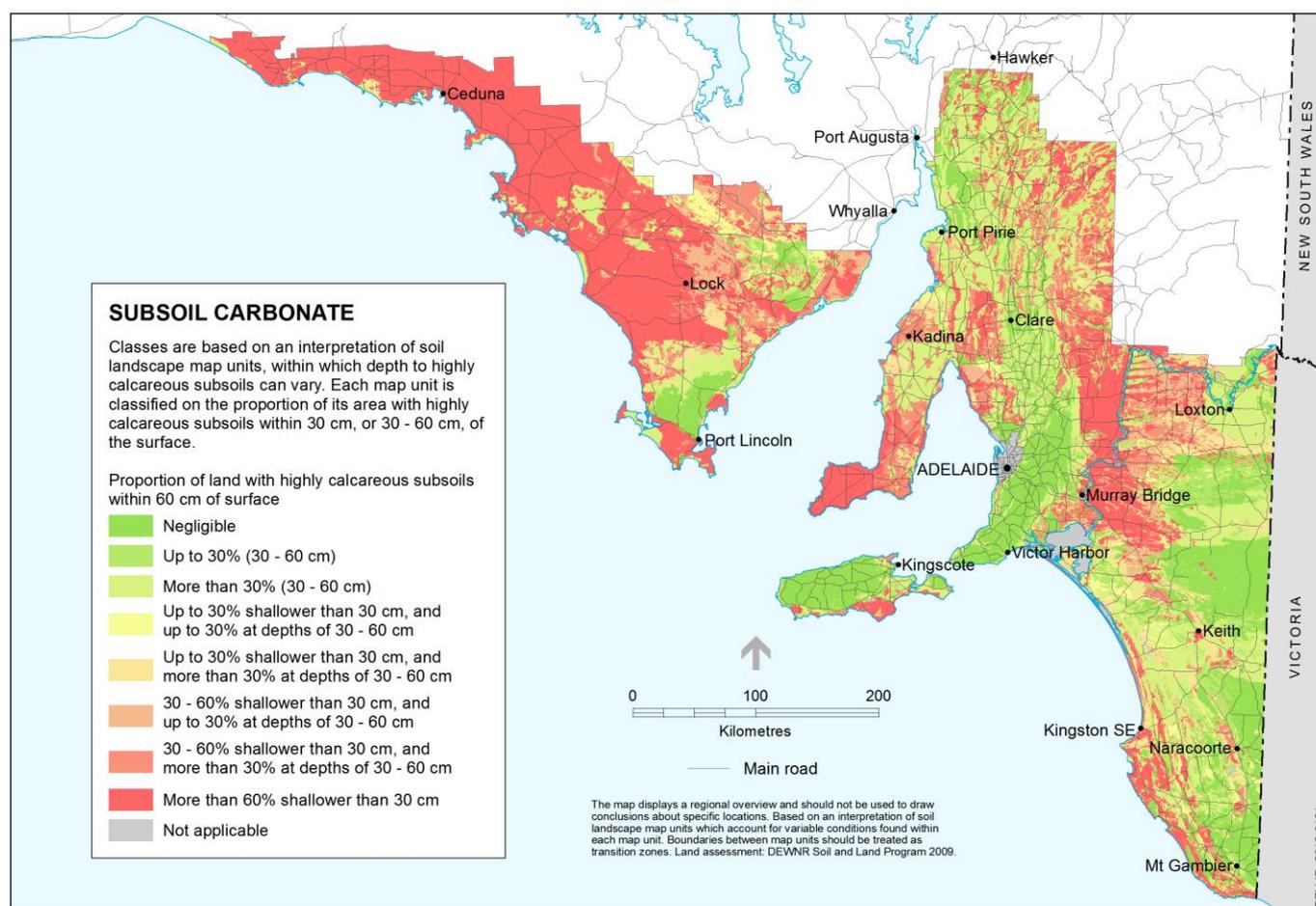


## Displaying data in soil maps

Soil and land attribute maps display a simplified version of the underlying data. Mapping classes are based on an interpretation of soil landscape map units, within which the depth to, and reactivity of, *Subsoil carbonate* (i.e. fine carbonate in the soil matrix) can vary. Each map unit is categorised according to the area proportion containing highly calcareous subsoils (i.e. strong reaction to 1 M HCl) within 30 cm or 30-60 cm of the surface.



*Subsoil carbonate can tie up nutrients and impede root growth*



## Further information

- View data on [NatureMaps](#) (→ Soils)
- Read the [metadata](#) for this layer
- Read more about [soil attribute mapping](#)
- Contact [Mapland](#)

Download from Enviro Data SA:

- [Statewide map](#) and [spatial dataset](#)
- [Assessing Agricultural Lands](#) (Maschmedt 2002)
- Soils of Southern SA book [Part 1](#) and [Part 2](#)



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