Alkalinity

Alkalinity is usually an inherent characteristic of soils, although it can be increased by irrigation with alkaline or saline water

Alkalinity is typically associated with the presence of finely divided carbonate which reduces hydrogen ion concentrations in the soil solution. Alkaline soils (which are generally confined to <400 mm annual rainfall areas) can cause problems for plant growth due to reduced availability of phosphorous and essential trace elements (zinc, manganese, copper, and iron). Correction of alkalinity is generally not practicable.

Plant species and varieties have varying tolerance to alkaline conditions. Soils made alkaline by calcium carbonate (i.e. calcareous soils) alone rarely have pH_{water} >8.3. Alkaline soils with pH >8.3 usually have significant exchangeable sodium (i.e. sodic soils) or carbonates and bicarbonates of sodium. Extensive observations indicate that cereal root growth is very poor or non-existent in soils (particularly clayey soils) with pH_{water} values exceeding 9.2.

Land assessment in southern South Australia

Assessments are made according to soil pH measurements, and extrapolation between similar environments. *Alkalinity* attribute classes account for conditions in both the surface (0–10 cm) and subsoil (30–80 cm).

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 *Alkalinity* class (e.g I1_1, I1_2, etc.) have been estimated for each map unit.

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

Alkaline calcareous loams are the most widespread soil class across South Australia's agricultural zone

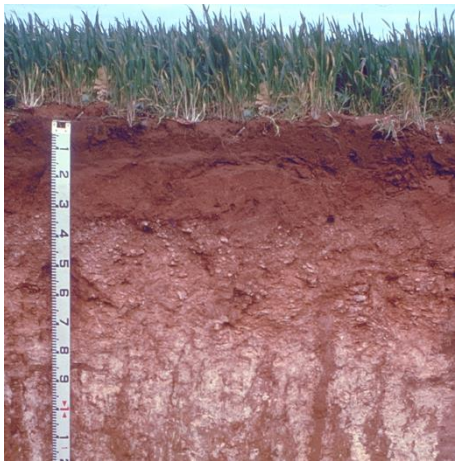
Area statistics

pH of surface# (0–10 cm)	pH of subsoil# (30–80 cm)	Area	Cleared land	Class*
Non alkaline	Non alkaline	14.31%	13.92%	I1_1
	Alkaline	22.18%	24.83%	I1_2
	Strongly alkaline	8.95%	11.23%	I1_3
Alkaline	Alkaline	15.3%	13.58%	I2_2
	Strongly alkaline	37.11%	34.24%	I2_3
Strongly alkaline (10–30 cm)		0.46%	0.14%	I3_3
Strongly alkaline (0–10 cm)		0.29%	0.35%	I4_3
Not applicable		1.42%	1.70%	IX
TOTAL HECTARES		15,765,460	10,439,300	

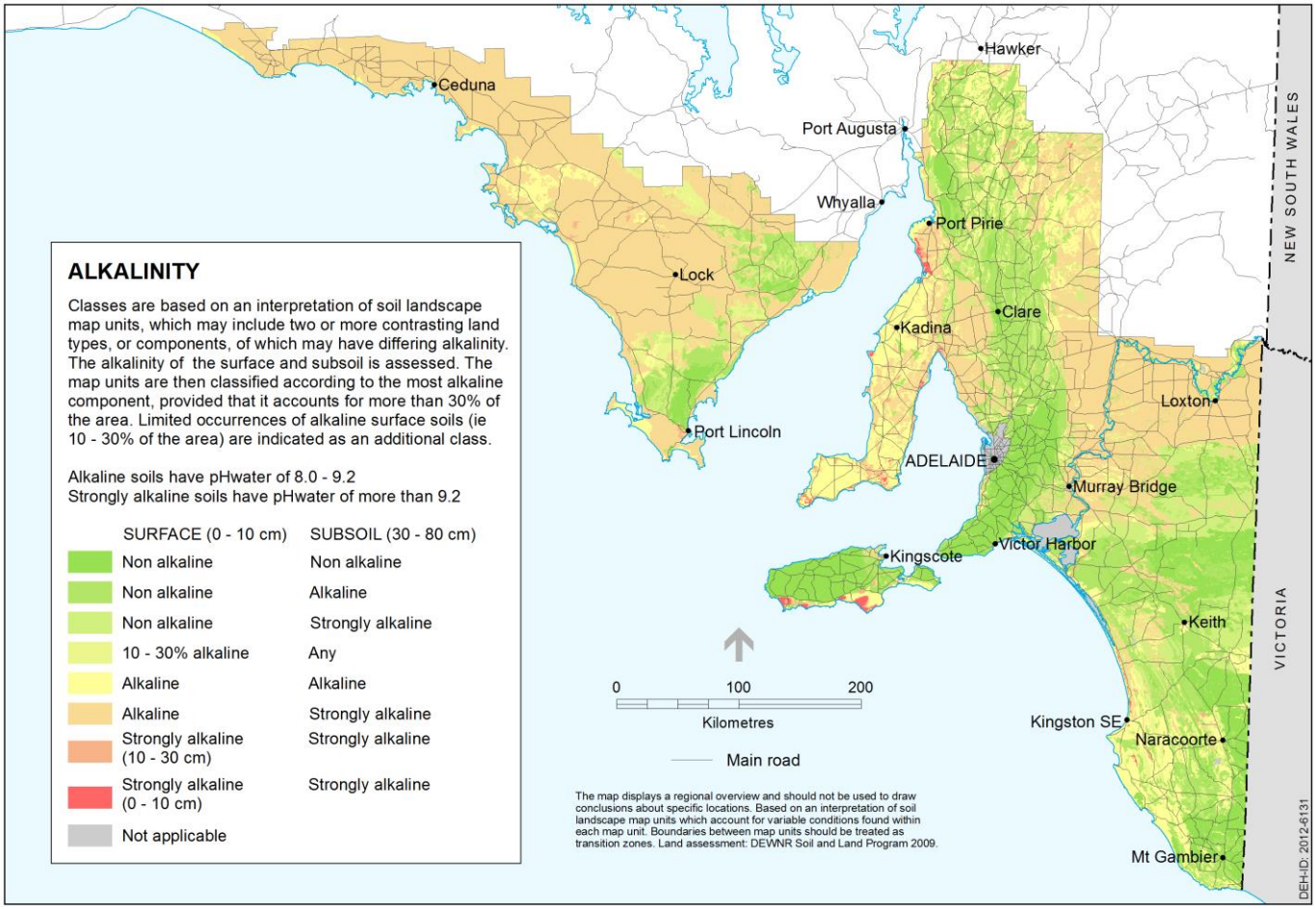
* The letter 'I' denotes classes that are specific to *Alkalinity*. # pH categories are defined overleaf.

Displaying data in soil maps

Mapping classes are based on an interpretation of soil landscape map units, which may include a number of landscape elements (components) with differing *Alkalinity*. Map units are classified according to the most alkaline component, provided that it accounts for more than 30% of the area. Limited occurrences of alkaline surface soils (i.e. 10–30% of the area) are indicated as an additional class.



Strong subsoil alkalinity (often associated with high boron, sodium and salts) can restrict the growth of crop roots



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

#pH categories	pH_{water}	pH_{CaCl2}
Non alkaline	<8.0	<7.0
Alkaline	8.0–9.2	7.0–8.5
Strongly alkaline	>9.2	>8.5