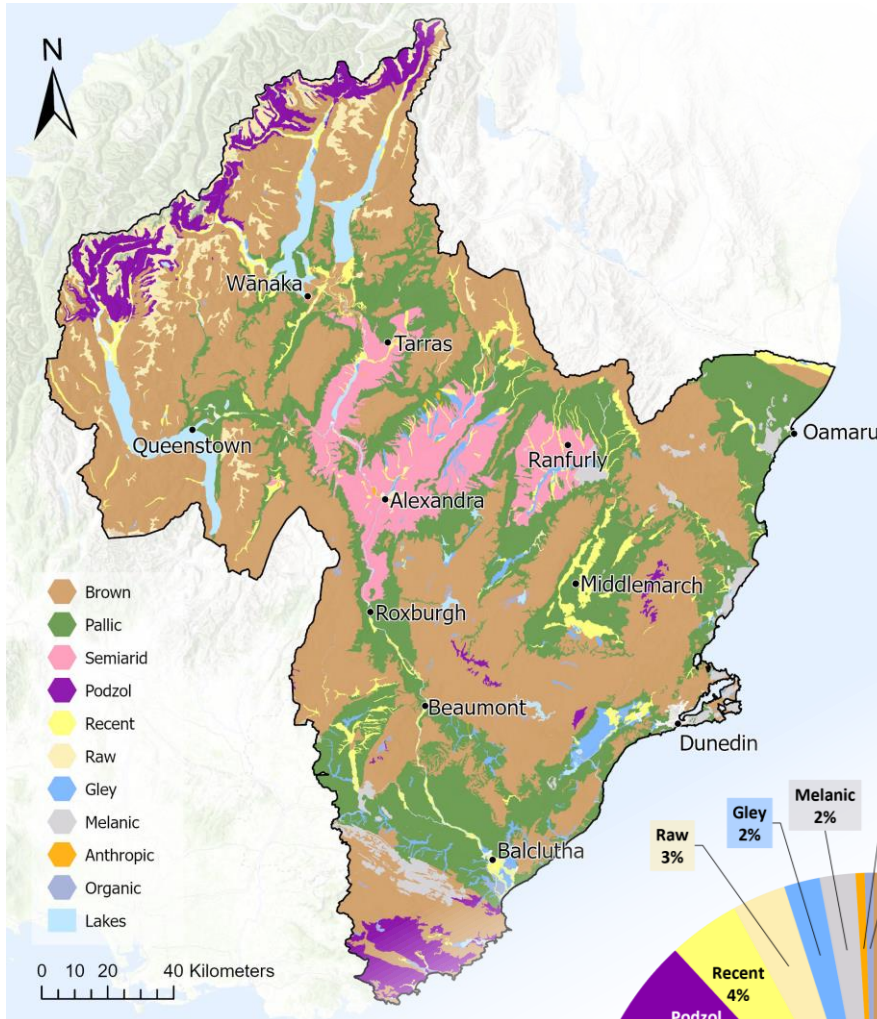


Soil in Otago

New Zealand Soil Classification orders

Description

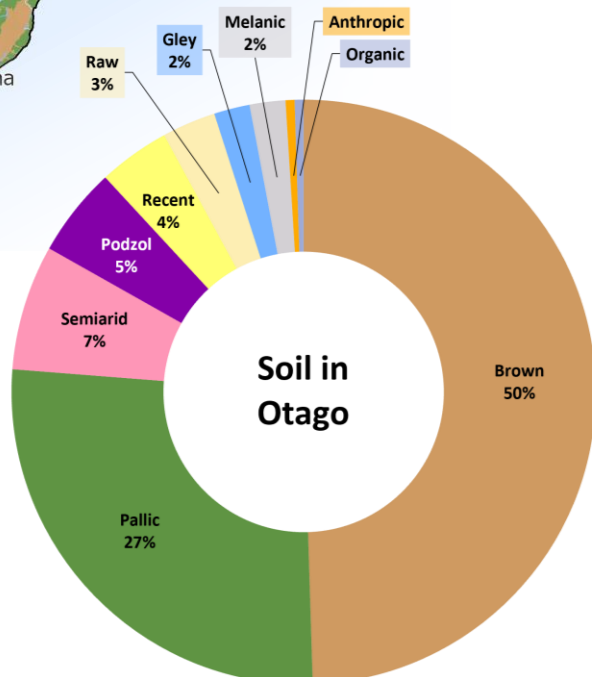
The New Zealand Soil Classification (NZSC) system recognises 15 soil orders that all differ in their characteristics, behaviour and appearance. In Otago, around 10 of these are found - 8 of which have regional extents greater than 1%.










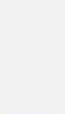
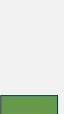

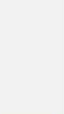



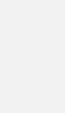
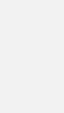

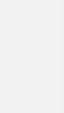


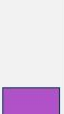
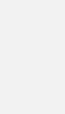

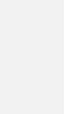
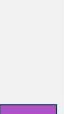


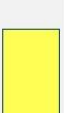
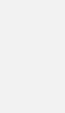
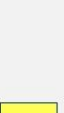

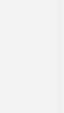


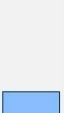
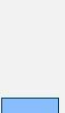

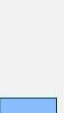

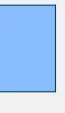


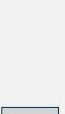


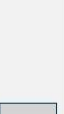



In the region

The formation of soils in Otago are determined by climate, organisms, topography, parent material and time. As such, the distribution of the soil orders is characterised by a combination of these factors. The dry basins of Central Otago form dense Semiarid soils, while areas of native bush under high rainfall host acidic Podzols.

Between these extremes, the extensive Pallic and Brown soils are found in hills and high country across the region. Young Raw and Recent soils are formed from erosion and deposition of parent material on slopes and by rivers. Raw soils are less developed than the more versatile Recent soils. Gley soils are found where water tables are high, or drainage is poor. Melanic soils have dark topsoil formed from limestone and volcanic rock.



Soil profile	Bulk density	Clay	Organic carbon	pH	P retention	Available water	NZSC orders and key characteristics
 <p>[1] [2]</p>	<p>Denser</p>  <p>Looser</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Alkaline</p>  <p>Acidic</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Brown</p> <p>Low natural fertility but with generally good drainage and rooting depth unless acidic or shallow.</p>
	<p>Denser</p>  <p>Looser</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Alkaline</p>  <p>Acidic</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Pallic</p> <p>Medium to high fertility with imperfect to poor drainage due to high density and/or presence of pans which limit rooting.</p>
	<p>Denser</p>  <p>Looser</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Alkaline</p>  <p>Acidic</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Semiarid</p> <p>Well drained soils with moderate fertility limited by rooting depth due to density, stoniness, and dryness.</p>
	<p>Denser</p>  <p>Looser</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Alkaline</p>  <p>Acidic</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Podzol</p> <p>Low fertility, prolonged wetness high subsoil density and/or pans limit plant productivity. High organic matter contents.</p>
	<p>Denser</p>  <p>Looser</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Alkaline</p>  <p>Acidic</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Recent</p> <p>Highly fertile due to frequent deposition of fine sediment with deep rooting and good drainage make these productive soils.</p>
	<p>Denser</p>  <p>Looser</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Alkaline</p>  <p>Acidic</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Gley</p> <p>Poorly drained soil that remains wet unless drained. Medium to high fertility but rooting limited by lack of oxygen at depth.</p>
	<p>Denser</p>  <p>Looser</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Alkaline</p>  <p>Acidic</p>	<p>High</p>  <p>Low</p>	<p>High</p>  <p>Low</p>	<p>Melanic</p> <p>High natural fertility, well drained and deep soil unless directly over rock. Versatile and productive soils.</p>

N.B. Raw soil is not included due to the lack of soil development.

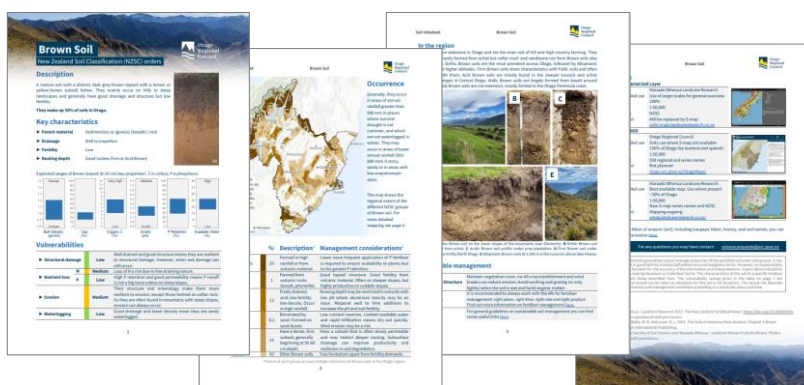
Vulnerabilities

The soil orders in Otago naturally have different vulnerabilities to environmental and production-related risks due to their mineralogy, landscape position, chemistry and physical structure.

	Brown	Pallic	Semiarid	Podzol	Recent	Gley	Melanic
► Structural damage	Low	Medium	High	Medium	High	High	Low
► Nutrient loss	Medium	Medium	High	Low	High	Medium	Medium
► Erosion	Medium	High	High	High	Medium	Low	Low
► Waterlogging	Low	Medium	Medium	Low	Low	High	Low

More information

For more information on the soil orders, the different groups within them and soil mapping resources, as well as examples and management considerations, see the individual information sheets available on the ORC website under the Land and Soil webpage.



For the te ao Māori of oneone (soil), including kaupapa Māori, history, and soil names, you can find more information [here](#).

Contact

For any questions you may have contact:

science.enquiries@orc.govt.nz

Note - This Infosheet generalises typical average properties of soil orders. It has been prepared in good faith by trained staff within time and budgetary limits. However, no responsibility or liability can be taken for the accuracy of the information and interpretations. Expert advice should be sought before making decisions on individual farms. The characteristics of the soil at a specific location may differ from those described here. The vulnerability ratings given are generalised and should not be taken as absolutes for the soil in all situations. The actual risk depends on the environmental and management conditions prevailing at a particular place and time.

References

- [1] Manaaki Whenua - Landcare Research 2023. The New Zealand SoilsMapViewer. https://doi.org/10.26060/9vfz_hw43. Photos reproduced with permission.
- [2] Hewitt, A.E., Balks, M. R. and Lowe, D.J., 2021. The Soils of Aotearoa New Zealand. Springer International Publishing.