

The Seven Soil Wonders of the Central Otago basins

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Central Otago has a special combination of soil forming factors in New Zealand, with distinct continental climate features - being the hottest and coldest, driest, and furthest region from the sea. It has predominantly schist parent material, a long history of alpine glaciation, and sedimentation within a series of inland basins. The extensive erosion products of this landscape evolution are preserved as flights of terraces and fans deposited over the last 0.6 M yrs.

This environment has resulted in a suite of unique soil characteristics, which can be highlighted as 'The Seven Soil Wonders of Central Otago':

1. Pedogenic lime – despite the non-calcareous parent materials, Semiarid soils often show accumulation of subsoil pedogenic lime.
2. Reddish colouration of a strongly developed argillic horizon in some old soils. A hypothesis has been mooted that the source is Australian aeolian clay sized parna, crossing the Tasman as red dust, to accumulate and be preserved in the semiarid environment.
3. New Zealand's only inland salty soils. Despite salinity seen as not being a feature of NZ soils, in the Semiarid soils of Central Otago soluble salts are common. Irrigation enhanced redistribution has caused secondary salinization issues.
4. Highly fragile soils. Compared with other regions, the soils have high slaking and dispersion vulnerability, and are weakly chemically buffered.
5. Low erosion. Despite its appearance, Central Otago has very low geo-denudation rates, compared to extremely high rates close to the Alpine fault where forest cover is continuous. There is little post settlement alluvium, which is a common feature of Australian soil-landscapes.
6. Past evidence of high Moa grazing density. This implies a substantial and reliable biomass feed source that is not apparent now.
7. New Zealand's oldest soil – The protected conservation area at the Butchers Dam site contains probably NZ's oldest soil.