

# Physiographic zone: Alpine

Southland's physiographic zones allow us to better understand why we have variations in water quality in different areas. We've divided Southland into nine different zones according to factors such as soil type, geology and topography. Through them we can target solutions to higher risk areas as opposed to a region-wide, generalised approach.

## Understanding your zone

Each zone is different in the way contaminants build up and move through the soil, areas of groundwater, and into our streams and rivers. Physiographic zones allow us to target advice and management strategies to keep farm nutrients on the farm and out of waterways.

The Physiographics of Southland project was developed as part of *Water and Land 2020 & Beyond* so we can better understand:

- where our water comes from
- how water moves through the landscape
- why we have differences in water quality across the region

## What does 'Alpine' mean?

All land found higher than 800m above sea level. Soils are either very thin or non-existent.

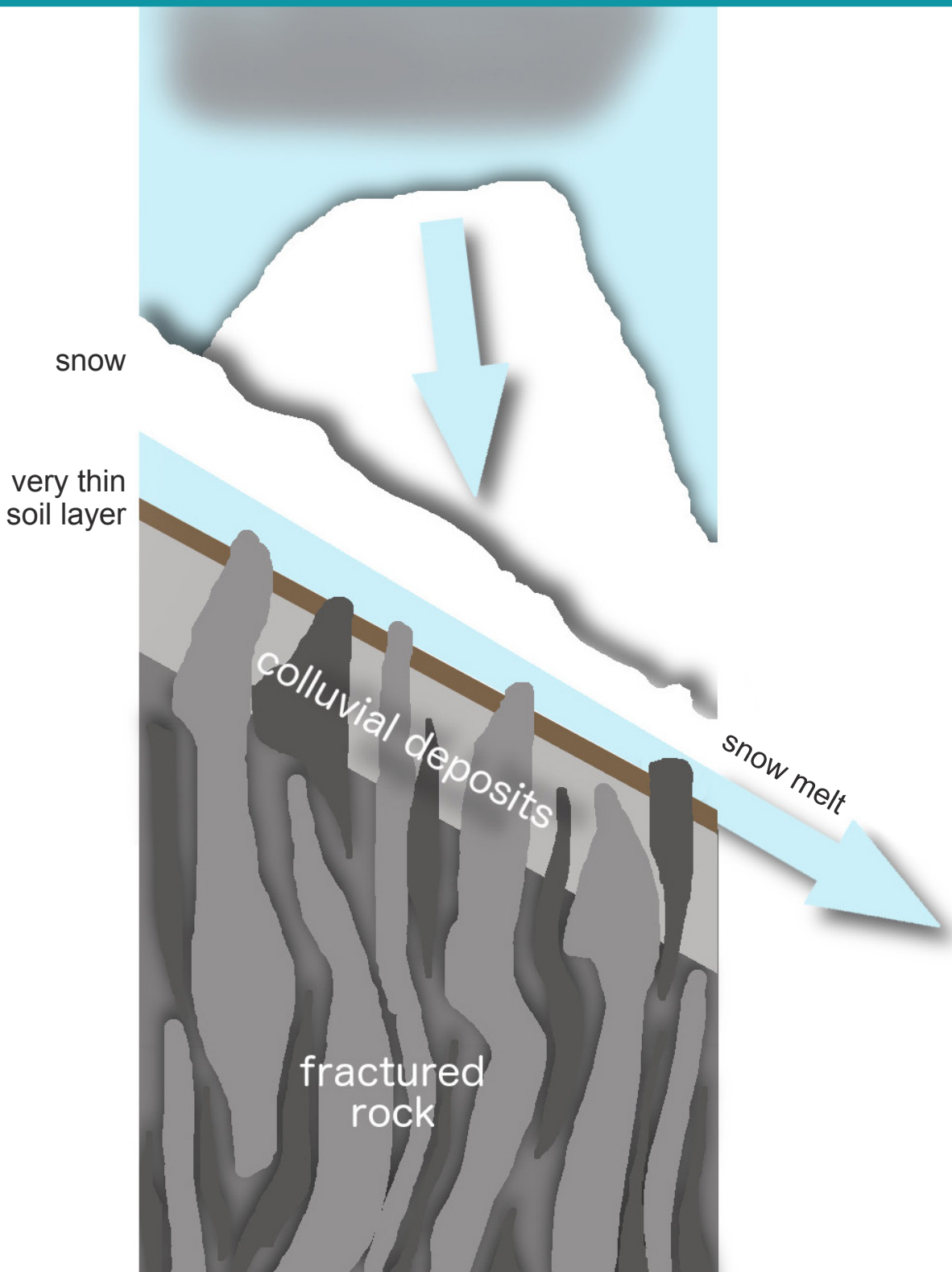
## Key features of the Alpine zone

- Steep-sloping land, with elevation higher than 800 metres above sea level.
- Mostly bedrock with little or no soil.
- High elevation results in high precipitation volumes occurring as rainfall and snow.
- Mainly in the headwaters in northern and western Southland.

## Water source and movement

- In response to rainfall, water flows across the land surface to a dense network of streams, which discharge to Southland's main rivers.
- Snowpack accumulation over winter, which melts in spring.
- Provides large source of water to Southland.
- No significant areas of groundwater present.

## Water movement in the Alpine zone



► Most of the water from the Alpine zone flows over the land surface as overland flow (also called runoff).

## Contaminant movement

Water flowing from alpine areas is largely pristine and doesn't contain contaminants associated with human activity. Alpine rivers and streams are a major source of recharge (top-up) water and dilution for lowland waterways and aquifers.

However, land use change in this unit has the potential to significantly degrade water quality in lower zones.

## What does this mean for water quality?

- ✓ There are few issues with water quality in this zone due to little or no land use development.
- ✓ Clean water from this zone contributes to high water quality standards in some downstream areas.
- ✗ Highly susceptible to contaminant losses if areas of the Alpine zone were developed by human activity.

## Improving Southland's water quality

The following good management practices are applicable to all physiographic zones in Southland:

- Capture nutrients, sediment and microbes in wetlands and sediment traps
- Nutrient management
- Riparian management
- Effluent management

## Good management in the Alpine zone

Overland flow is the main transport pathway for contaminants in the Alpine zone. Minimise contaminant loss from overland flow in this zone by:

- Protecting soil structure, particularly in gullies and near stream areas
- Managing critical source areas (CSA)
- Reducing Phosphorus use and loss

## Physiographic zones and the Water and Land Plan

Environment Southland has developed a proposed Southland Water and Land Plan, using the science behind the physiographic zones to inform the plan and provide a tailored approach to particular issues that have been identified for each zone.

The main aim of the plan is to introduce new methods that help to halt any further decline in water quality by managing activities that we know adversely affect the quality of Southland's freshwater – such as land use intensification, wintering and stock in waterways. A key focus of the changes is to shift all land owners towards good management practices in ways that will give the best gains for maintaining water quality.

## Further information

For more information about physiographic zones and good management practices contact Environment Southland. Phone 0800 76 88 45 or email [service@es.govt.nz](mailto:service@es.govt.nz). You can also find out more about the Physiographics of Southland and your zone on our website, [www.es.govt.nz](http://www.es.govt.nz).

What zone is your property in? View our map online: <http://bit.ly/waterandlandmaps>

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