

# Physiographic zone: Old Matura

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 is 'Old Matura' mean?

The Old Matura zone includes geology found only on older terraces in the Matura catchment.

Typically, soils in this zone are well drained, highly 'weathered' (broken down over time) and tend to accumulate nitrogen. Nitrogen also builds up in groundwater to high levels.

## Key features of the Old Matura zone

- Higher terraces located along the outer margins of the mid-Matura valley, specifically near Wendonside, Balfour and Knapdale.
- Well drained, stony, highly weathered soils.
- Little to no ability to remove nitrogen (denitrification) in soils and aquifers.
- Flat land.
- Few permanent surface waters such as streams or rivers.
- Little to no connection to main river systems, and therefore no dilution by pristine Bedrock/Hill Country and Alpine zone waters.

## Water source and movement

- Soils are well drained, with water draining straight down to underlying aquifers.
- Groundwater discharges as springs along the base of the terrace and also makes its way down to streams and aquifers on lower terraces (in other zones).

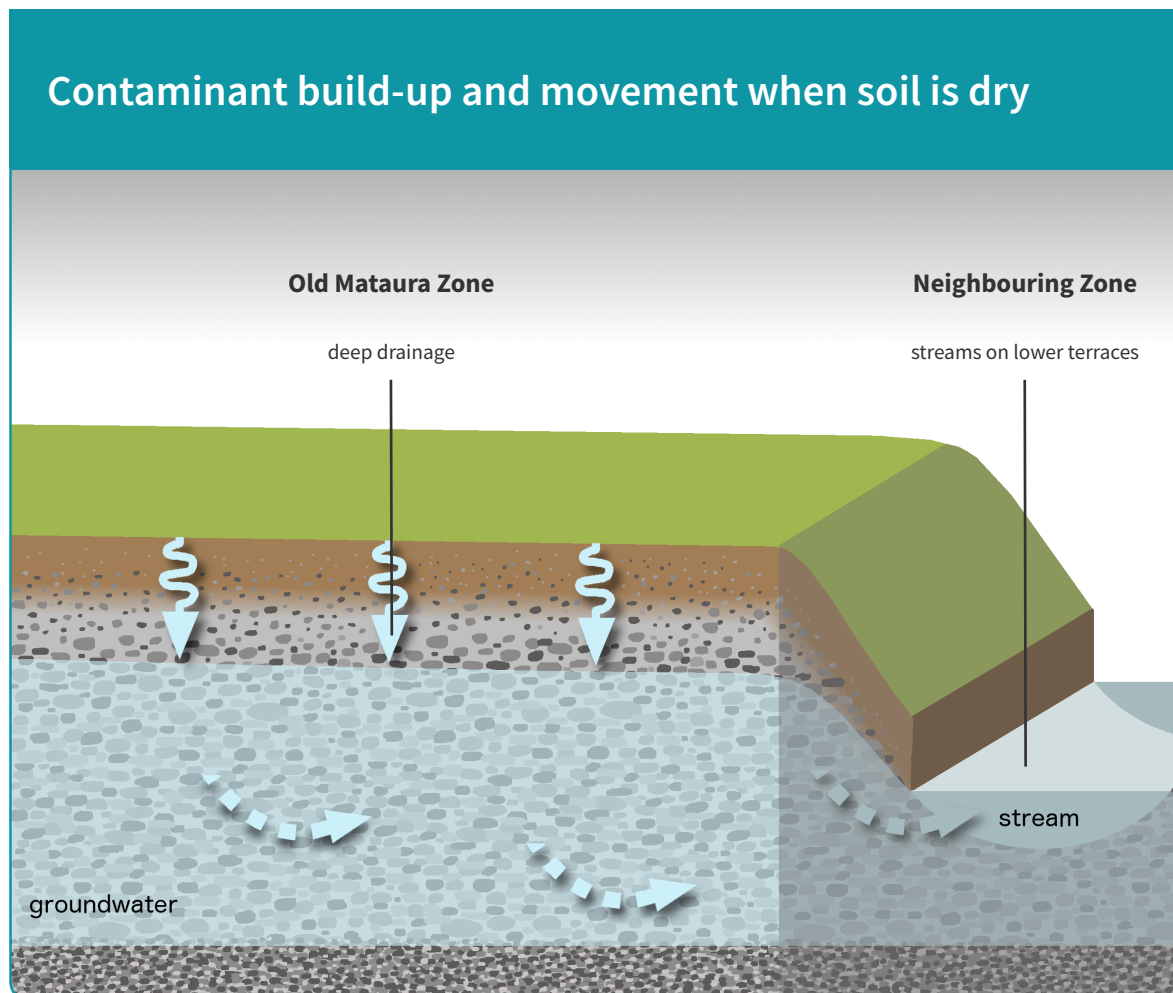
## Old Matura zone contaminant movement

Aquifers in the Old Matura zone are particularly at risk from high nitrogen levels. They often breach the National Drinking Water Standard, meaning the water can be unsafe to drink.

Groundwater in the Old Matura zone can accumulate nitrogen to excessively high levels due to:

- Limited denitrification ability of soils and aquifers
- Nitrogen leaching through the soil to groundwater
- Slow flow of groundwater through aquifers (more time for nitrogen to accumulate)
- Lack of dilution by any major rivers

Nitrogen is able to accumulate in the soil to high levels, particularly over drier months, and any nitrogen not used by plants eventually leaches down into the underlying aquifer when soils are wet. Overland flow only occurs during high intensity rainfall.



- Soils and underlying aquifers in the Old Matura zone also have little ability to remove nitrogen (via a process called denitrification). Streams and springs in lower areas that receive groundwater from this zone can breach the National Bottom Line for ecotoxicity. This means their ability to support healthy stream life populations is compromised.

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## What does this mean for water quality?



Contaminant loss from overland flow is low.



This zone is at high risk from nitrogen build-up in groundwater.



Groundwater from this zone makes its way to springs, streams and aquifers in lower parts of the Mataura catchment, contributing to contaminant loads in downstream rivers and aquifers.

## Improving 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 Old Mataura zone

In addition to the above, good management in the Old Mataura zone includes measures for reducing the effects of deep drainage.

Reduce the effects of deep drainage by reducing the accumulation of surplus nitrogen in the soil, particularly during autumn and winter.

## Physiographic zones and the Southland 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>