

Otago Hill Country Erosion Spatial Prioritisation: User Guide

■ What is it?

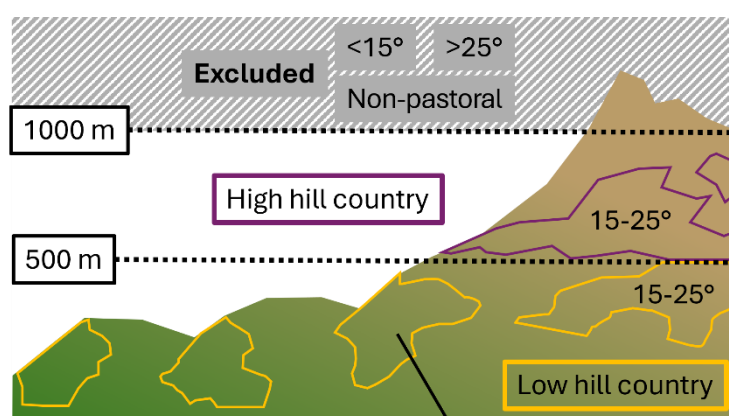
The spatial prioritisation was developed as a decision support tool for the Otago Hill Country Erosion Programme to support landowners to plan for, and treat, erosion prone land to protect vulnerable hill country. The tool allows for users to screen the region to determine areas of higher priority based on 1) the potential for the area to generate sediment from surface and stream bank erosion processes and 2) how effective mitigation is likely to be.

■ How was it made?

1. Defining hill country

Hill country was defined to narrow the area. This was pastoral land having slope angles between 15 and 25 degrees, at elevations less than 1,000 meters. This area was split at 500 m to prioritise lower elevations, where land is likely to be grazed more and/or cultivated - activities that create greater risk of erosion, and for which mitigation is likely to be more effective.

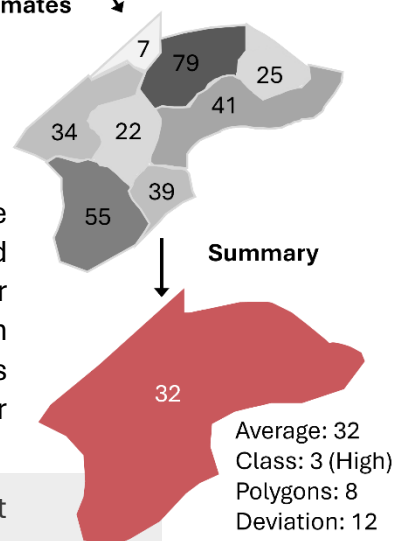
The process was desktop (GIS-based) and can be summarised in two steps



Modelled estimates

2. Model summary

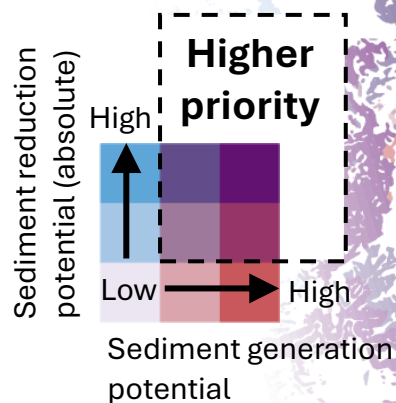
Sediment loss and sediment loss reduction estimates from the SedNetNZ model were summarised within the hill country areas to generate area-weighted averages. The sediment loss reduction estimates were from a modelled stock exclusion scenario which was used as an indicator for sediment loss reduction potential. The averages were then classed into medium, low and high for both sediment loss and sediment loss reduction which together determine their priority.



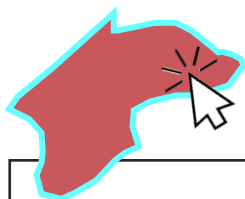
SedNetNZ estimates sediment generation and transport. It is used by eight other regional councils and has been adapted to Otago using data from our monitoring network.

Priority

Each area in the map has a colour which corresponds to its priority class and is based on both the sediment generation potential (risk of erosion) and sediment reduction potential (mitigation effectiveness) to create a priority ranking. The higher classes in both create the highest priority. Areas where high sediment generation but low reduction potential is expected likely have high natural erosion rates, like in many alpine valleys, where intervention will not make much difference. Other areas may have high sediment reduction potential but due to a low sediment generation the overall benefit of targeting these is low.



How to use it?



What does it mean?

When clicking on a polygon, you will get a table with information about it. Below describes what each row in that table represents and means.

Name	Description	Interpretation
Area	Polygon area in km ²	The area the polygon represents
Hill country type	“Low” (0–<500 m) and “High” (500–<1000 m) hill country types	To understand elevation and that low hill country is prioritised
Mitigation scenario	Whether the polygon was included in the mitigation scenario (“Yes”) or not (“No”)	“No” means the sediment reduction will be 0/class 1 (low) so needs to be checked
Summarised polygons	How many model polygons are summarised within the final polygon	Need to look at this with the deviation to understand how representative the average is
Sediment generation average	Sediment generation summarised within hill country polygons by average (t/km ² /y)	Individual polygon averages carry high uncertainty but the relative difference to others is meaningful
Sediment generation deviation	How much the modelled sediment generation estimates deviate from the mean	Generally, <10 is low, ca. <100 is medium and above this into the thousands is high
Sediment generation class	Sediment generation averages put into 3 classes	1 is low, 2 is medium and 3 is high for prioritisation
Sediment reduction average (absolute)	Average sediment reduction summarised within hill country polygons by average (t/km ² /y)	Individual polygon averages carry high uncertainty but the relative difference to others is meaningful
Sediment reduction average (relative)	Average sediment reduction summarised within hill country polygons by average (%)	This is more meaningful at smaller scales to understand greatest reduction potential
Sediment reduction deviation (absolute)	How much the modelled sediment reduction estimates deviate from the mean	Generally, <10 is low, ca. <100 is medium and above this into the thousands is high
Sediment reduction class (absolute)	Sediment reduction averages put into 3 classes	1 is low, 2 is medium and 3 is high for prioritisation
Sediment reduction deviation (relative)	How much the modelled sediment reduction estimates deviate from the mean	Generally, <20 is low, ca. <50 is medium and above this is high
Sediment reduction class (relative)	Sediment reduction averages put into 3 classes	1 is low, 2 is medium and 3 is high for prioritisation at smaller scales

At what scale?

- **Regional - best use**

The tool was developed to screen the whole region to focus on broad priority areas. Overall patterns and relativity of sediment generation are robust and representative. The map is most reliable at this scale because averages reduce local model uncertainty.

- **Catchment / sub-regional - considered use**

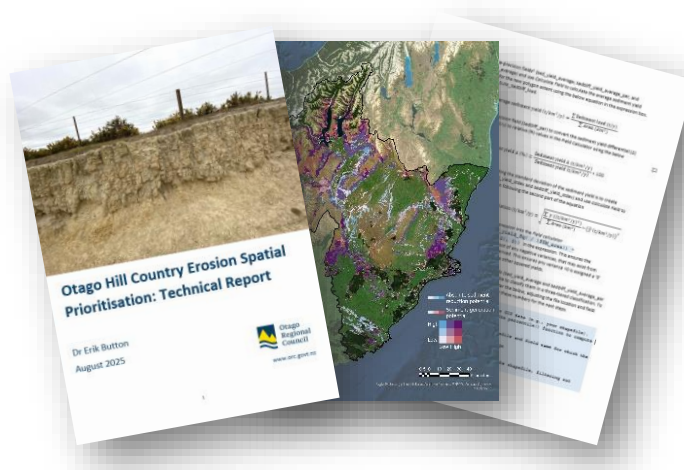
The best use depends on the size of the area. Larger areas can be treated as for regional scale, but smaller areas require a more considered approach with attention to the variability of the polygon averages. Use the map to identify sub-catchments or clusters of priority polygons within the area. Combine with local knowledge (farmers, land management advisors) to pick specific areas. For smaller areas, follow as for property/farm-scale use.

- **Property / farm-scale - use cautiously**

At this scale focus is on few polygons and so the uncertainty will be high. It's important to look at the number of polygons summarised and deviation from the averages. The absolute sediment reduction values become more abstract and sensitive to local characteristics at this scale, and the relative values may be more informative. In general, the map can flag possible focus areas, but model inputs are coarse for farm-scale decisions. Treat the layer as a starting point: follow up with field checks and local information before making decisions.

■ Where do I find more information?

The technical report contains detail on the background, methodology and application of the prioritisation tool. It can be found at orc.govt.nz/hillcountryprioritisation



You can email science.enquiries@orc.govt.nz for specific questions.

More information on the Hill Country Erosion Programme can be found at orc.govt.nz/hillcountryerosion/