

National Map Soil Erosion

Over the last 150 years following European settlement, much of the original indigenous forest in New Zealand has been converted to pastoral agriculture. In hill country, where trees are important for stabilising slopes, deforestation has led to increased soil erosion and consequently increased sedimentation in waterways. This can have detrimental effects on aquatic ecosystems by smothering fish habitat and significantly reducing the penetration of photosynthetically active light. In catchments where stop banks have been constructed to reduce the risk of flooding, deposition of sediment in floodways reduces flood capacity.

Erosion in New Zealand is dominated by mass-movement processes including landslides, large gullies, and earthflows. These processes relate primarily to rock type, rainfall and vegetation cover as given in the New Zealand empirical erosion model (Dymond et al., 2010). This model gives the long term erosion rate, e , in tonnes of soil eroded per square kilometre per year as

$$e = a C R^2$$

where a is an erosion coefficient depending on erosion terrain (defined primarily by geology), C is a factor depending on the type of vegetation, and R is mean annual rainfall in mm. From a national map of erosion terrains, vegetative cover, and mean annual rainfall, a national map of erosion may be produced.

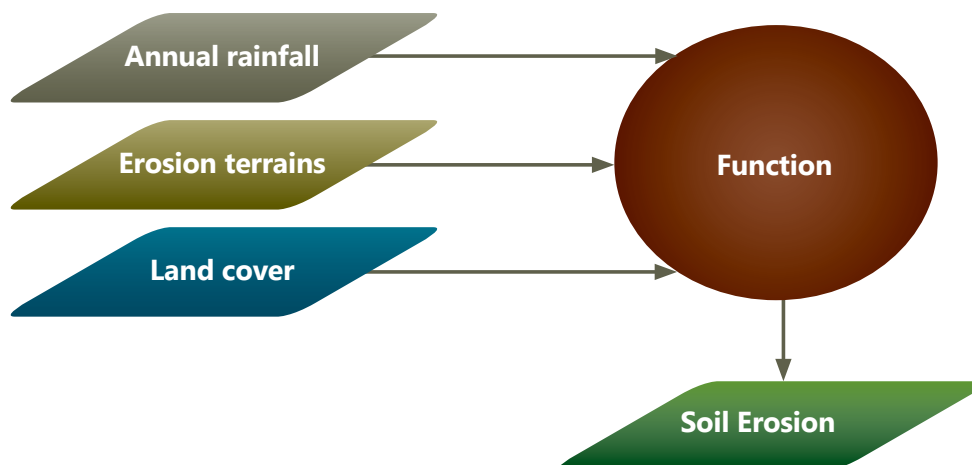


FIGURE 1. *Annual rainfall:* national map of mean annual rainfall from LENZ at 100m pixels (Leathwick et al., 2003).

Erosion terrains: national map of erosion terrains at 15m pixels (Dymond et al., 2010).

Land cover: national map of basic land cover in 2002-2003 at 15m pixels (Dymond et al., 2010)

REFERENCES

Leathwick, J. and others. Land Environments of New Zealand. David Bateman, Auckland.

Dymond, J.R., Betts, H.D., Schierlitz, C.S., 2010. An erosion model for evaluating regional land-use scenarios.

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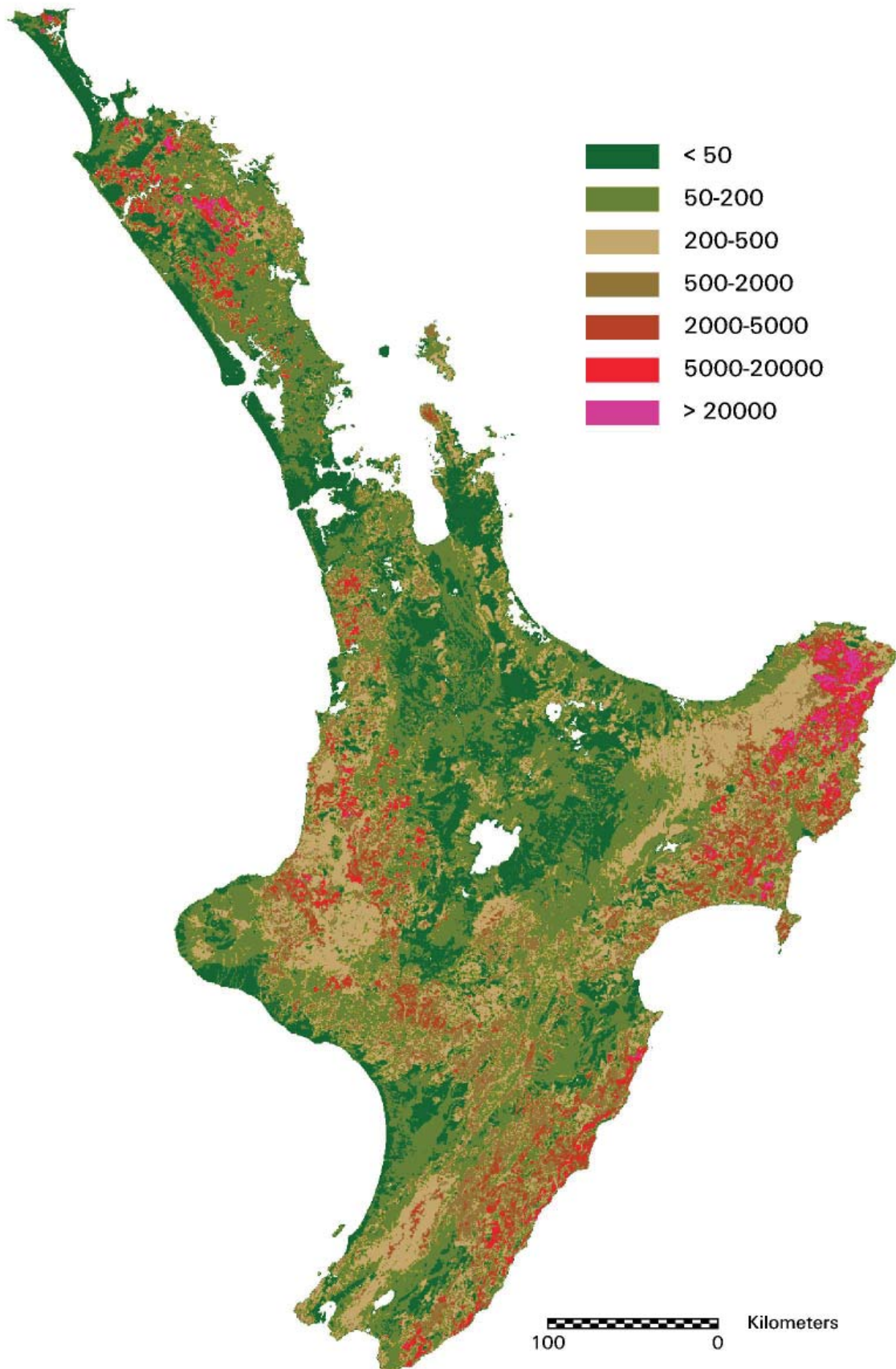


FIGURE 2: Long-term mean erosion rates for the North Island (15m pixels) in 2002/2003.

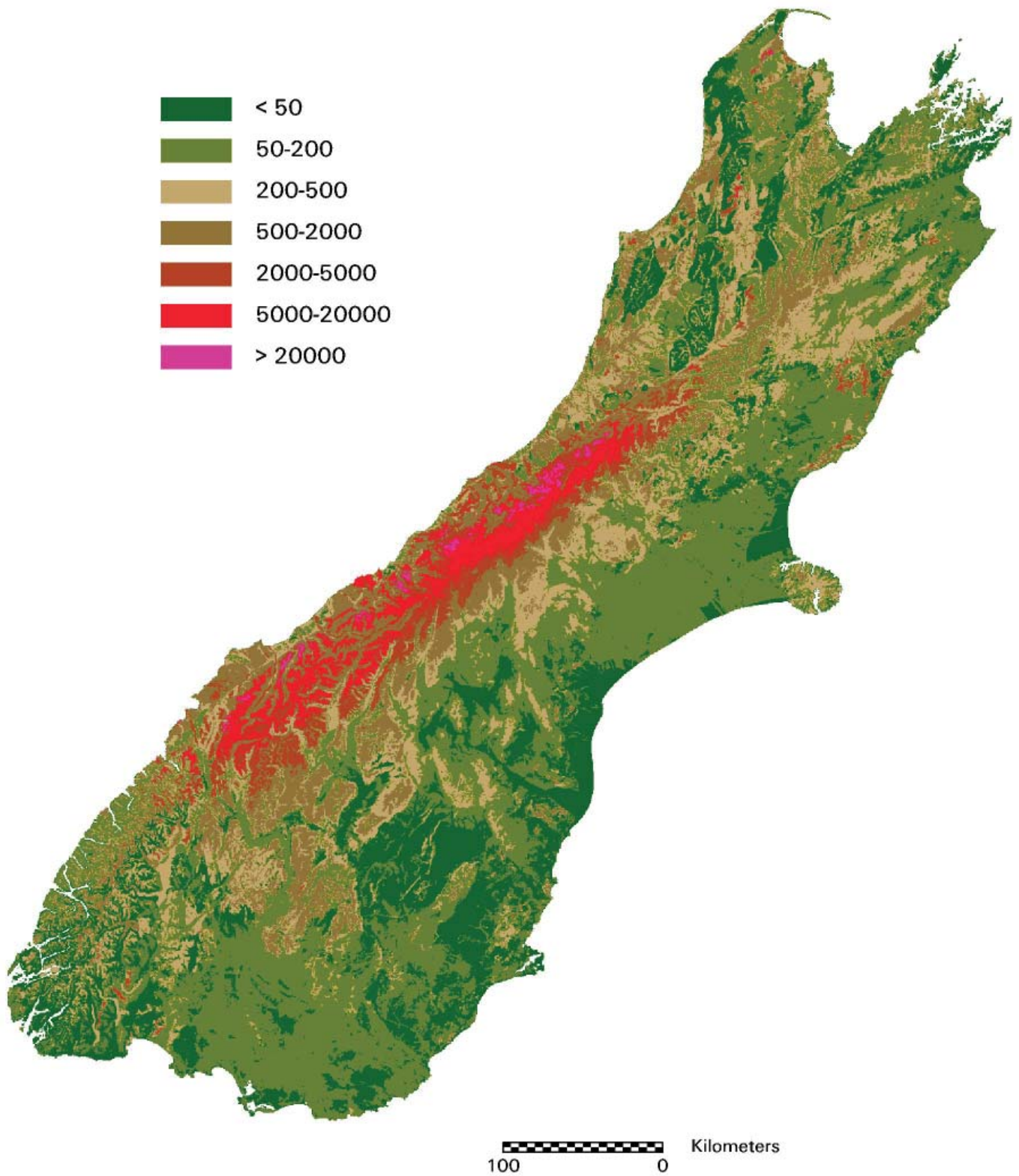


FIGURE 3: Long-term mean erosion rates for the South Island (15m pixels) in 2002/2003.

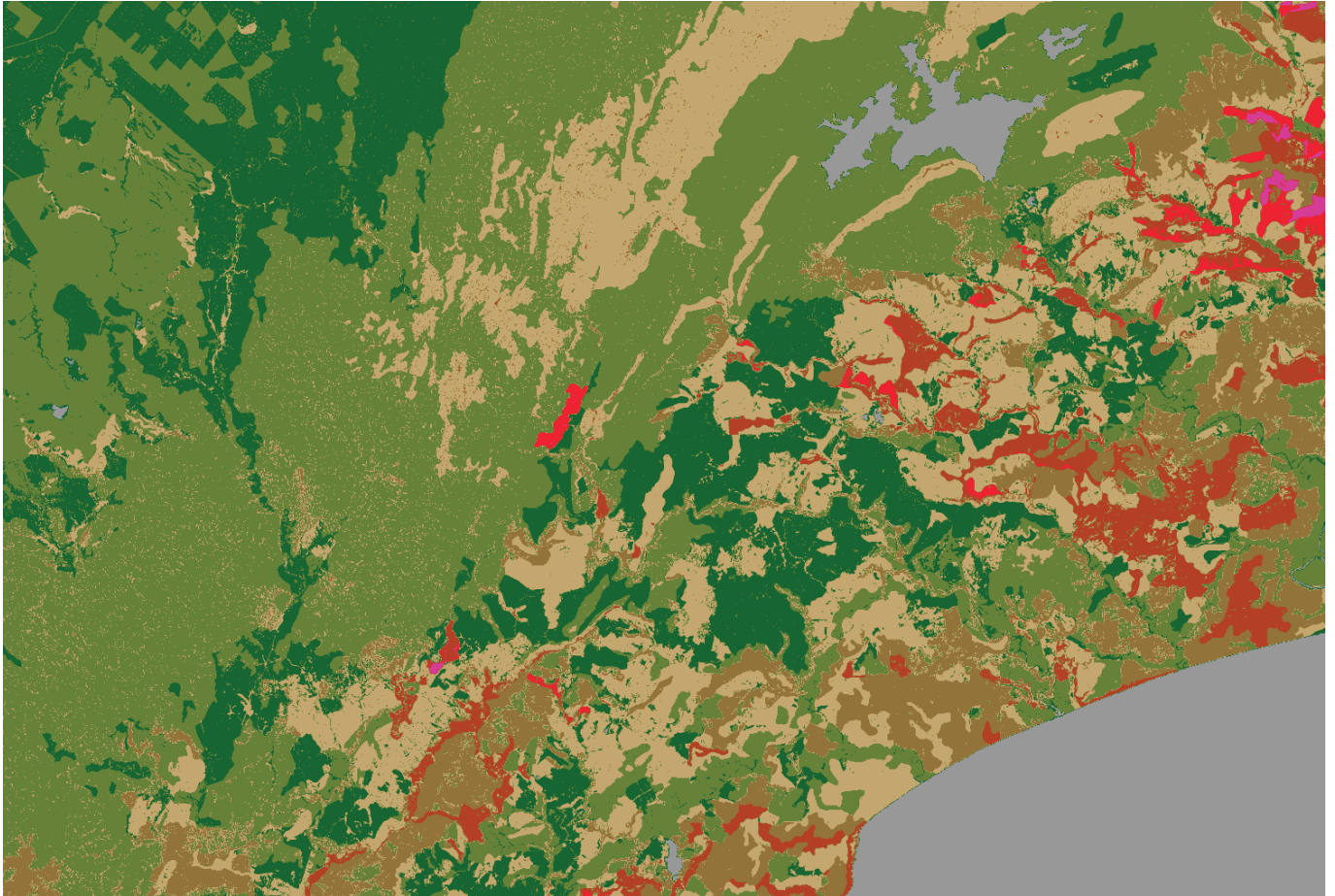


FIGURE 4: Long-term mean erosion rates (15m pixels) for hill country between Lakes Tutira and Waikaremoana.

