

Comparing stream nutrient loads to Overseer estimates for a hill country sub-catchment

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Hill country represents a significant proportion of New Zealand water catchment areas, particularly in the Manawatu region (75%). Improving our understanding of nutrient loss and nutrient attenuation in pastoral hill country is essential in assisting beef and sheep farmers to adapt to inevitable nutrient loss restrictions in the future. An on-going water quality study has been established at Massey University's hill country farm Tuapaka, near Palmerston North, to monitor nutrient and sediment loads leaving an 85 ha sub-catchment. Two years of monitoring results will be presented in this paper. Detailed Overseer nutrient budget modelling of this sub-catchment provided estimates of N and P losses to water and these values were compared with the monitored nutrient loads. A comparison with historic (1976) nutrient loads measured from a larger catchment (180 ha) on the same farm, was also undertaken. The current monitoring study showed that N, P and sediment concentrations leaving the sub-catchment were generally low, with elevated nitrate-N concentrations being measured in response to increased stream flow (as a result of surface runoff and drainage). The nitrate-N and total P loads measured for the first year of the study were lower than those estimated using an Overseer nutrient budget (1.3 vs 7 kg N/ha/year and 0.13 vs 1.1 kg P/ha/year) for the sub-catchment. The lower measured losses could be explained by nutrient attenuation processes, as the sub-catchment contains natural features which enhance N and P attenuation, such as seepage wetlands and hill side seeps which may not be fully accounted for in the current version of Overseer. However, climatic and farm management factors may also help explain these low values, so analysis of the second year of data is essential to improve our understanding of nutrient loss and attenuation processes in this environment. These additional data will be presented and discussed.