



Nutrient loads and hillslope generation processes from burnt mountain catchments in SE Australia

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Following a severe wildfire in 2003, two small mountain catchments in SE Australia vegetated by wet eucalypt forests were instrumented to measure exports of water, sediment and nutrients. To link catchment fluxes with hillslope processes and point stores, rainfall simulation experiments, and soil and vegetation surveys were conducted to gain insights into sediment and nutrient generation, transport and delivery. Loads of particulate N and P were estimated on a 15 minute timestep for 3 years following the fires, and dissolved forms from almost 1200 samples. Rainfall simulation experiments were conducted every 6 months in both burnt and unburnt sites to measure seasonal rates of N and P generation. Exports of P were dominated by the adsorbed fraction and were highly correlated with suspended sediment concentration. Particulate P represented >90 % of the total load. TN exports were dominated by the particulate fraction in the first year after the fire, but were relatively evenly split between particulate and dissolved forms in subsequent years as the generation of sediment on hillslopes and delivery to the stream declined, and the relative importance of dissolved forms in subsurface stormflow and baseflow increased. The decline in particulate N after the first post-fire year was not related to decreased ratios of nitrogen to suspended solids. Nitrate concentrations were the slowest to recover to unburnt levels and may reflect the importance of post-fire nitrification in these ecosystems. Nutrient enrichment of sediment from point - hillslope - catchment was in the order of 1.5-3 times the soil stores. N and P loads probably increased by 5-10 fold after the fire, and appeared to have returned to re-fire levels by the end of year 3. Although the importance of the particulate N load declined over time, particulates comprised > 86% and 95% of the

P load, 56-70% of the N load over the three post-fire years.