



## Quantitative Generalizations for Catchment Sediment Yield Following Plantation Logging

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While there is a reasonably clear qualitative understanding of the impact of forest plantations on sediment yield, there is a lack of quantitative generalizations. Such generalizations would be helpful for estimating the impacts of proposed forestry operations and would aid the spread of knowledge amongst both relevant professionals and new students. This study therefore analyzed data from the literature to determine the extent to which quantitative statements can be established. The research was restricted to the impact of plantation logging on catchment sediment yield as a function of ground disturbance in the years immediately following logging, in temperate countries, and does not consider landslides consequent upon tree root decay. Twelve paired catchment studies incorporating pre- and post-logging measurements of sediment yield were identified, resulting in forty-three test catchments (including 14 control catchments). Analysis yielded the following principal conclusions:

- 1) Logging generally provokes maximum annual sediment yields of less than a few hundred t km<sup>-2</sup> yr<sup>-1</sup>; best management practice can reduce this below 100 t km<sup>-2</sup> yr<sup>-1</sup>.
- 2) At both the annual and event scales, the sediment yield excess of a logged catchment over a control catchment is within one order of magnitude, except with severe ground disturbance.
- 3) There is no apparent relationship between sediment yield impact and the proportion of catchment logged. The effect depends on which part of the catchment is altered and on its connectivity to the stream network.
- 4) The majority of catchments delivered their maximum sediment yield in the first two years after logging.

The logging impacts were classified in terms of the absolute values of specific sediment yield, the values relative to those in the control catchments for the same period and the values relative both to the control catchment and the pre-logging period.

Most studies have been for small catchments (< 10 km<sup>2</sup>) and temperate regions; the impact at large catchment scales and in tropical regions requires further research.