

NITROGEN BUDGETS ON APPALACHIAN FOREST CATCHMENTS

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Abstract: Variations in nitrogen losses in streamflow on catchments in the Appalachians suggests that the level of nitrogen retention in hardwood forests varies widely. Stream losses of dissolved nitrate-N on several small experimental forested catchments range from about 0.2 to 8.5 kg ha⁻¹ y⁻¹. This wide range of losses is equivalent to less than 10% to nearly 100% of measured atmospheric nitrogen wet deposition in the region. Forest stand age and condition and levels of atmospheric wet N deposition do not correlate well with observed differences in catchment N losses. Variations in soil mineralization and nitrification rates and soil C/N ratios appear to be one cause of variations. Ammonium-N export from forested catchments is quite low and can generally be ignored. Organic-N export is not often evaluated, but estimates indicate that export of dissolved organic-N in streamflow may be as important as nitrate-N losses. Organic-N losses may be quite sensitive to forest management activities and should be evaluated for accurate nitrogen budgets. Improved predictions of nitrogen losses on forest land are needed for models of water quality in receiving waters such as the Chesapeake Bay and for prediction of forest land response to changing levels of atmospheric deposition.

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