

## The effects of human land use on flow regime and water chemistry of headwater streams in the highlands of Chiapas

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We studied the effects of land use changes on flow regime and water chemistry of headwater streams in the highlands of Chiapas, a region in southern Mexico that has experienced high rates of deforestation in the last decades. Samples for water chemistry were collected and discharge was measured between September 2007 and August 2008 at eight streams that differed in the land uses of their riparian and catchment areas, including streams draining protected forested areas. Streams with high forest cover (>70%) in their catchments maintained flow through the year. Streams draining more disturbed catchments exhibited reduced or no flow for 4 – 6 months during the dry season. Nitrate concentrations were lower at streams draining forested catchments while highest concentrations were measured where conventional agriculture covered a high proportion of the catchment and riparian zone. Highest phosphorus concentrations occurred at the catchment where poultry manure was applied as fertilizer. Differences between forest streams and those draining disturbed areas were correlated with the proportion of forest and agriculture in the riparian zone. Variation in stream variables among sampling dates was lower at the forest sites than at the more disturbed study streams. Conversion of forest into agriculture and urban areas is affecting flow regime and increasing nutrient concentrations, although the magnitude of the impacts are influenced by the type of agricultural practices and the alteration of the riparian zone.

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