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Deforestation impacts on discharge of the Ji-Paraná River – Brazilian Amazon

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Abstract Hydrological impacts of land-use changes have been studied for several decades in relatively small basins using the paired catchment experimental approach. In large river basins this kind of experiment is of limited use, and the assessment of impacts can only be done by applying physically-based hydrological models. We analysed impacts of deforestation on streamflow of the river Ji-Paraná (southern Amazon) using the MGB-IPH hydrological model. Three forest cover scenarios were simulated: pristine condition with predominant (~100%) forest cover; current condition with about 57% deforestation; and a hypothetical 100% deforestation scenario. Results suggest that average annual discharge of the river Ji-Paraná increases by about 31 mm for each 10% of the basin drainage area that is deforested. These results are consistent with worldwide experimental studies, but are not verified in observed streamflow records of the Ji-Paraná River.

Key words land use change; MGB-IPH model; distributed hydrologic model